BRICK TOWNSHIP BOARD OF EDUCATION
BRICK TOWNSHIP HIGH SCHOOL

346 CHAMBERS BRIDGE ROAD
BRICK, NJ 08723

FACILITY ENERGY REPORT

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I. HISTORIC ENERGY CONSUMPTION/COST

The energy usage for the facility has been tabulated and plotted in graph form as depicted within this section. Each energy source has been identified and monthly consumption and cost noted per the information provided by the Owner.

Electric Utility Provider:	Jersey Central Power & Light
Electric Utility Rate Structure:	GS Secondary 3 Phase
Third Party Supplier:	HESS

Natural Gas Utility Provider:	New Jersey Natural Gas
Utility Rate Structure:	DEL GSS
Third Party Supplier:	None

The electric usage profile represents the actual electrical usage for the facility. The electric utility measures consumption in kilowatt-hours (KWH) and maximum demand in kilowatts (KW). One KWH usage is equivalent to 1000 watts running for one hour. One KW of electric demand is equivalent to 1000 watts running at any given time. The basic usage charges are shown as generation service and delivery charges along with several non-utility generation charges. Rates used in this report reflect the historical data received for the facility.

The gas usage profile within each facility report shows the actual natural gas energy usage for the facility. The gas utility measures consumption in cubic feet x 100 (CCF), and converts the quantity into Therms of energy. One Therm is equivalent to 100,000 BTUs of energy.

Table 1
Electricity Billing Data

ELECTRIC USAGE SUMMARY

Utility Provider: Jersey Central Power & Light
Rate: GS Secondary 3 Phase
Meter No: 100017744499, 100017744796, 100019011632
Account # 20 00 00 0106 4 1
Third Party Utility Provider: HESS
TPS Meter / Acct No: N/A / 519194

MONTH OF USE	CONSUMPTION KWH	DEMAND	TOTAL BILL
Feb-10	76,119	256.0	$11,644
Mar-10	118,853	324.5	$17,462
Apr-10	104,094	353.1	$15,830
May-10	113,529	403.0	$17,299
Jun-10	135,995	451.8	$18,593
Jul-10	139,352	387.7	$8,157
Aug-10	124,873	325.7	$16,484
Sep-10	122,052	428.7	$16,935
Oct-10	110,510	403.9	$15,251
Nov-10	109,576	353.6	$14,824
Dec-10	108,624	328.3	$14,602
Jan-11	85,748	297.4	$11,898
Totals	**1,349,325**	**451.8 Max**	**$178,978**

AVERAGE DEMAND 359.5 KW average

AVERAGE RATE $0.133 $/kWh

Figure 1
Electricity Usage Profile

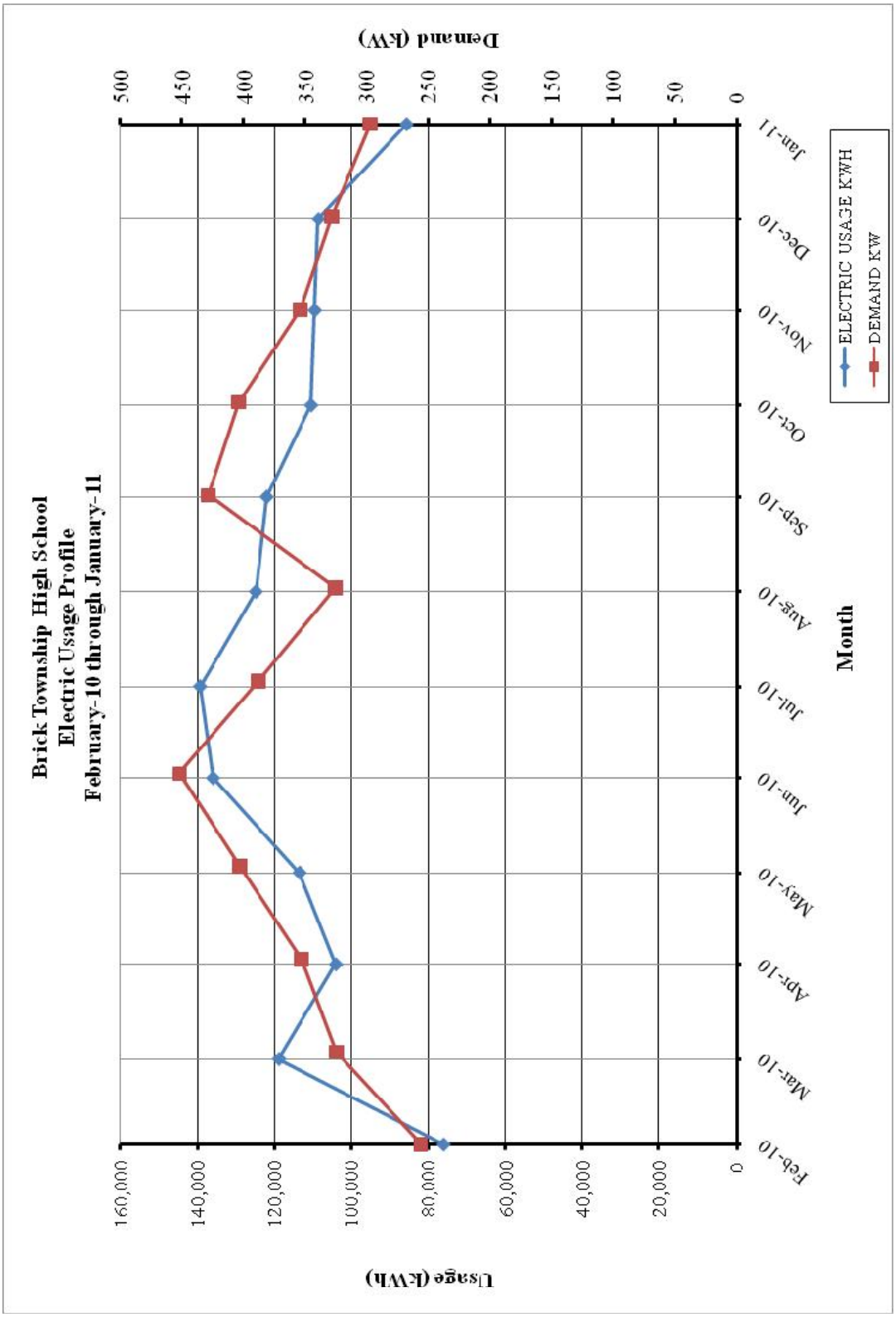


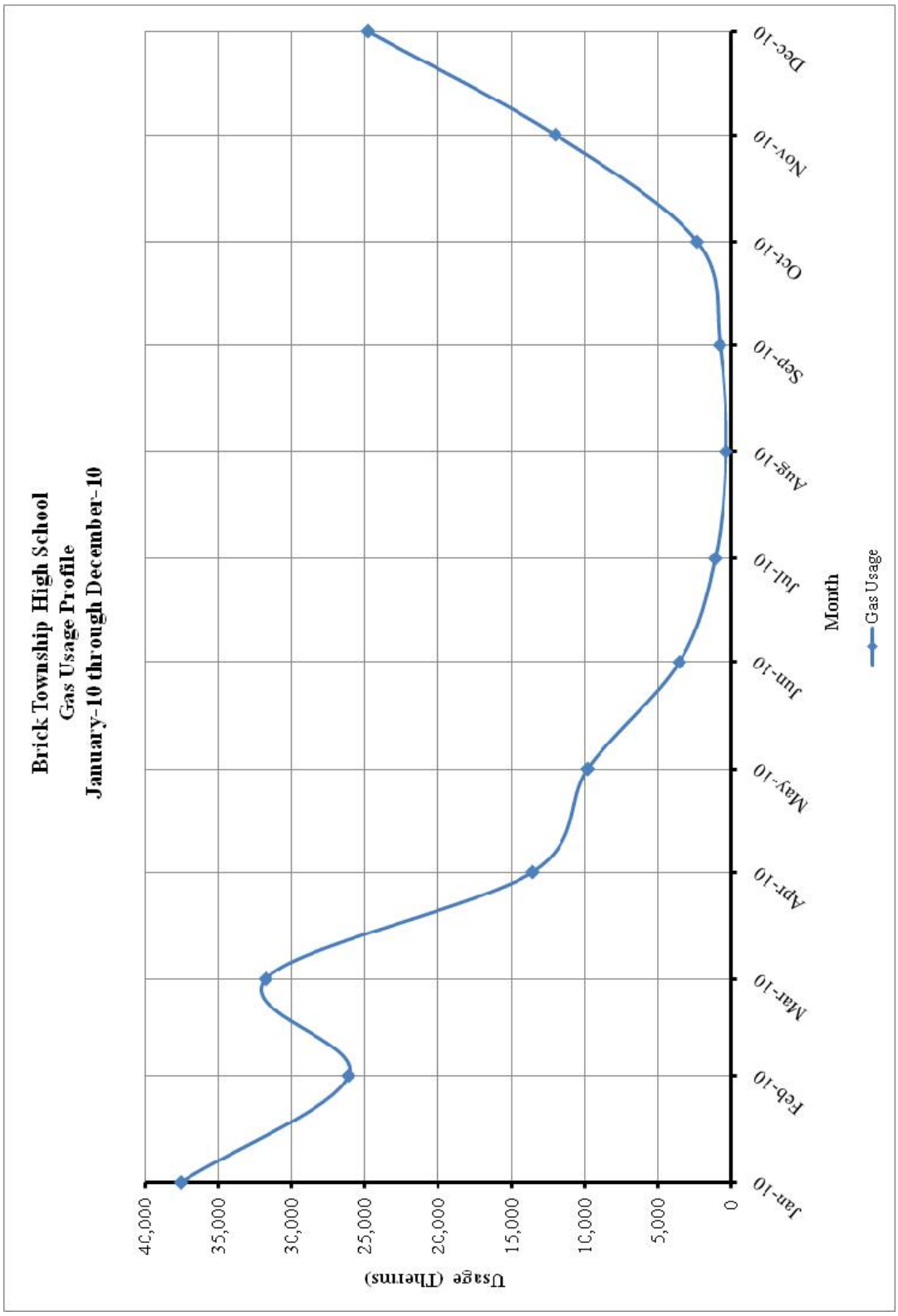
Table 2
Natural Gas Billing Data

NATURAL GAS USAGE SUMMARY	
Utility Provider:	New Jersey Natural Gas
Rate:	DEL GSS
Meter No:	852385
Point of Delivery ID:	04-4531-3300-23.
Third Party Utility Provider:	N/A
TPS Meter No:	N/A

MONTH OF USE	CONSUMPTION (THERMS)	TOTAL BILL
Jan-10	37,499.06	$44,210.62
Feb-10	26,080.12	$32,383.87
Mar-10	31,714.80	$37,034.22
Apr-10	13,525.69	$15,588.28
May-10	9,780.69	$11,454.23
Jun-10	3,524.58	$5,421.13
Jul-10	1,091.50	$2,998.33
Aug-10	352.27	$2,247.21
Sep-10	766.11	$2,651.71
Oct-10	2,314.13	$4,114.84
Nov-10	11,970.50	$13,567.54
Dec-10	24,734.80	$28,889.09
TOTALS	**163,354.25**	**$200,561.07**

AVERAGE RATE: **$1.23** **$/THERM**

Figure 2
Natural Gas Usage Profile



II. FACILITY DESCRIPTION

Brick Township High School is located on 346 Chambers Bridge Road in Brick Township, New Jersey. The 216,326 square foot high school was constructed in two phases. The West building was constructed in 1958 and the East building was constructed in 1961. Two story additions on the front and rear of the building were constructed in 1970. This addition included the library on the front of the building and classrooms on the rear of the building. The weight room adjacent to the East auxiliary gym was added in 2002.

Occupancy Profile

The typical hours of operation for the school are Monday through Friday between 7:00 am and 2:00 pm, from September through June. There is limited occupancy during the summer months. The school employs 204 people with a student enrollment of approximately 1,600.

Building Envelope

Exterior walls of the school are 4" face brick on 8" concrete block. Insulation within the walls, if any, is unknown. Typical windows throughout the school are a single pane, ¼" un-insulated glass with aluminum frames. Areas of the West end of the building utilize glass brick. The majority of the roof is flat, built up rubber with a light stone covering. The roof over the auditorium is a barrel style roof. The amount of insulation below the roofing ranges from 2" to 5" depending on the location and slope of the roof.

HVAC Systems

West Section

The HVAC system of the West section of the building consists of hot water boilers, perimeter heating units, rooftop heating and cooling units and split system D/X cooling units.

The main heating component of the west building is three gas fired H.B. Smith 440-1 Mills hot water boilers that have a heating output capacity of approximately 4,960 MBH and a boiler efficiency of approximately 77%. These boilers are original to the building and at an age of 52 years have far surpassed their useful service life of 30 years, as defined by ASHRAE. These boilers are in fair to poor condition and are recommended to be replaced. Heating hot water is circulated throughout the West section of the building via four hot water pumps. These pumps are all located in the west section boiler room. The pumps are identified as serving four separate zones in the building. It is unclear from the piping arrangement which part of the building is covered by each zone. There are two 7-1/2 HP pumps, one 10 HP pump, and one 1-1/2 HP pump. All of these pumps are base mounted, end-suction type. The pumps appear to be original to the building. All of the pump motors appear to be replacements, however, the current condition of each motor indicates that they have surpassed their useful service life and are not operating at optimal efficiency.

The classrooms are all served by thru-wall heating and ventilating units. These units are vintage Nesbitt models with hot water heating coils equipped with 2-way valves. These units are in

poor condition and many of are no longer in operation. The units are controlled by wall mounted slide type thermostats.

The Auditorium is served by two Carrier 27-Ton packaged VAV units. These units are also equipped with supplementary 26kW electric resistance heating coils. These units have a rated efficiency of 8.5 EER with an integrated part load value (IPLV) of 8.0. The units are approximately 17 years old, according to manufacturer data, and have surpassed their useful service life of 15 years, as defined by ASHRAE. In addition, modern day units of this capacity have far superior operating efficiencies, making these units ideal for replacement.

The faculty dining in the rear of the West section of the building is served by a cooling only, 4-ton packaged Trane rooftop unit with D/X coil. This unit has an EER of 10.0 and is in good condition. This unit is five years old and is still within its useful service life.

The main office and guidance offices are each served by a 5-ton split system. The outdoor condensing units of these systems are both Bryant models with an EER of 9.2. These units are approximately seven years old and are still within their useful service life of 15 years, per ASHRAE standards.

The West gymnasium is served by two large ceiling mounted heating and ventilating units. These units appear to be vintage Nesbitt units with hot water heating coils. The heating coils have a pneumatically controlled 3-way valve. The controls for this valve appear to be disconnected, indicating that these units are no longer in service, or functioning properly. In addition, these units appear to be original to the building, indicating that they have far surpassed their useful service life, per ASHRAE standards.

Classroom 117 is served by a 3-ton Arcoaire cooling only packaged rooftop unit with D/X cooling coil. This unit is has an estimated EER of 9.0, based on its age and condition. The unit is approximately five years old, is in good condition and is within its useful service life.

Classroom 121 is served by a 3-Ton Snyder General cooling only packaged rooftop unit with D/X cooling coil. This unit has an estimated EER of 8.0 based on its age and condition. This unit is approximately 17 years old, is in poor condition and has surpassed its useful service life of 15 years as defined by ASHRAE.

East Section

The HVAC of the East section consists of steam boilers, steam to hot water shell and tube heat exchangers, perimeter heating units, rooftop heating and cooling and several split system cooling units.

The boilers that serve the East section are two Weil McLain steam boilers with an input rating of 3,500 MBH and an output of 2,800 MBH with a boiler efficiency of approximately 77%, based on the age and condition of the boilers. These boilers are original to the building and have far surpassed their useful service, per ASHRAE. The steam is converted to hot water for heating via two shell and tube heat exchangers (HX-1 and HX-2), located in the boiler room. The only section of the building that is heated directly with steam is the East gymnasium. Heating hot

water is circulated throughout the East section of the building via four base mounted, end suction pumps, also located in the boiler room. HX-1 is served by three of these pumps. Two of these pumps are rated for 46 GPM at 35 feet of head and the third pump is rated for 115 GPM at 50 feet of head. All three of these pumps area appear to be original to the building and are in poor condition. The pumps and motors have far exceeded their useful life, as defined by ASHRAE. The second heat exchanger (H-2) is served by a single pump. The flow of this pump is not known, but its motor has a rating of 3-HP. This pump is also in poor condition and has exceeded its useful life.

Similar to the East section, the classrooms of the West section are all served by thru-wall heating and ventilating units. These units are vintage Nesbitt models with hot water heating coils equipped with 2-way valves. These units are in poor condition and many of are no longer in operation. The units are controlled by wall mounted slide type thermostats.

The East gymnasium is served by two ceiling mounted, vintage Nesbitt heating and ventilating units. These units are equipped with steam heating coils. These units are original to the building and have far surpassed their useful service life. In addition, it was brought to our attention by the maintenance staff that these units have not been in operation for the past eight to ten years.

The East auxiliary gymnasium is served by two ceiling mounted vintage Nesbitt heating and ventilating units. These units are equipped with hot water heating coils with pneumatic operated 3-way valves. These units are also in fair to poor condition and have surpassed their useful service life.

The weight room adjacent to the East gym is served by a 20-ton packaged rooftop unit manufactured by Aaon. This unit has a D/X cooling coil and natural gas fired heating. This unit was installed in 2002 as part of the weight room addition and is in good condition. The rooftop unit is still well within its useful service life.

There are three ductless split systems that serve the east gymnasium office areas. These three units are rated for 1 ton, 1-1/2 ton and 2 ton with estimated EER's of 9.0 based on the age and condition of each. All three units utilize R-22 refrigerant. These condensing units are in fair condition and are still within their useful life, per ASHRAE.

Exhaust System

Air is exhausted from the toilet rooms through the roof exhausters. The roof exhaust fans are controlled by the building's central control system and operate based on occupied/unoccupied settings.

HVAC System Controls

The Control system of the high school is a pneumatic to electronic control system, as manufactured by Andover. The controllers operate the main heating and cooling components of the facility including the boilers, pumps, heating and ventilating units and exhaust fans

Domestic Hot Water

Domestic hot water for the West section is provided by the boiler hot water via a hot water generator with internal heat exchanger. The hot water generator tank was manufactured by Whitlock Mfg in 1957 and has an approximate capacity of approximately 1,500 gallons.

Domestic hot water for the East section is provided by the boiler steam via a hot water generator with internal heat exchanger. The hot water generator tank is manufactured by old Dominion Iron and Steel Corp. in 1961 and has a capacity of approximately 1,071 gallons.

Lighting

Refer to the **Investment Grade Lighting Audit Appendix** for a detailed list of the lighting throughout the facility and estimated operating hours per space.

III. MAJOR EQUIPMENT LIST

The equipment list contains major energy consuming equipment that through implementation of energy conservation measures could yield substantial energy savings. The list shows the major equipment in the facility and all pertinent information utilized in energy savings calculations. An approximate age was assigned to the equipment in some cases if a manufactures date was not shown on the equipment's nameplate. The ASHRAE service life for the equipment along with the remaining useful life is also shown in the Appendix.

Refer to the **Major Equipment List Appendix** for this facility.

IV. ENERGY CONSERVATION MEASURES

Energy Conservation Measures are developed specifically for this facility. The energy savings and calculations are highly dependent on the information received from the site survey and interviews with operations personnel. The assumptions and calculations should be reviewed by the owner to ensure accurate representation of this facility. The following ECMs were analyzed:

Table 1
ECM Financial Summary

ENERGY CONSERVATION MEASURES (ECM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST[A]**	**ANNUAL SAVINGS[B]**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
ECM #1	Lighting Upgrade	$18,841	$2,561	7.4	103.9%
ECM #2	Lighting Controls	$16,650	$2,516	6.6	126.7%
ECM #3	Condensing Unit Replacement	$46,073	$1,459	31.6	-52.5%
ECM #4	Rooftop Unit Replacement	$48,697	$2,745	17.7	-15.4%
ECM #5	Condensing Boiler Installation	$800,850	$44,395	18.0	66.3%
ECM #6	NEMA Premium Motors	$10,254	$863	11.9	26.2%
ECM #7	Demand Controlled Ventilation	$62,000	$4,465	13.9	8.0%
ECM #8	NOT USED	-	-	-	-
ECM #9	Valve and Pipe Insulation	$7,550	$843	9.0	67.5%
ECM #10	HW VFD Pumping	$117,000	$9,903	11.8	27.0%
ECM #11	Window Replacement	$750,000	$19,430	38.6	-61.1%
ECM #12	Kitchen Hood Controls	$17,885	$1,465	12.2	22.9%
ECM #13	DDC Controls Upgrade	$757,141	$28,836	26.3	-42.9%
ECM #14	Domestic HWH Replacement	$55,765	$4,501	12.4	21.1%
ECM #15	Vending Machine Controls	$337	$415	0.8	1747.2%
ECM #16	Geothermal HP System	$4,529,012	$132,043	34.3	-12.5%
ECM #17	Water Conservation	$86,196	$7,899	10.9	37.5%
RENEWABLE ENERGY MEASURES (REM's)					
ECM NO.	**DESCRIPTION**	**NET INSTALLATION COST**	**ANNUAL SAVINGS**	**SIMPLE PAYBACK (Yrs)**	**SIMPLE LIFETIME ROI**
REM #1	Solary Array	$2,122,797	$227,446	9.3	60.7%

Notes: A. Cost takes into consideration applicable NJ Smart StartTM incentives.
B. Savings takes into consideration applicable maintenance savings.

Table 2
ECM Energy Summary

ENERGY CONSERVATION MEASURES (ECM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
ECM #1	Lighting Upgrade	16.0	29,941	-
ECM #2	Lighting Controls	10.5	18,918	-
ECM #3	Condensing Unit Replacement	8.4	10,790	-
ECM #4	Rooftop Unit Replacement	14.4	18,690	-
ECM #5	Condensing Boiler Installation	-	-	36,160
ECM #6	NEMA Premium Motors	1.5	6,490	-
ECM #7	Demand Controlled Ventilation	-	9,148	2,641
ECM #8	NOT USED	-	-	-
ECM #9	Valve and Pipe Insulation	-	-	685
ECM #10	HW VFD Pumping	-	118,350	-
ECM #11	Window Replacement	-	39,059	11,574
ECM #12	Kitchen Hood Controls	-	2,535	917
ECM #13	DDC Controls Upgrade	-	80,851	14,702
ECM #14	Domestic HWH Replacement	-	-	2,733
ECM #15	Vending Machine Controls	-	3,122	-
ECM #16	Geothermal HP System	-	(465,647)	157,854
ECM #17	Water Conservation	-	-	1,606
RENEWABLE ENERGY MEASURES (REM's)				
ECM NO.	DESCRIPTION	ANNUAL UTILITY REDUCTION		
		ELECTRIC DEMAND (KW)	ELECTRIC CONSUMPTION (KWH)	NATURAL GAS (THERMS)
REM #1	Solary Array	290.8	438,574	-

Table 3
Facility Project Summary

ENERGY SAVINGS IMPROVEMENT PROGRAM - POTENTIAL PROJECT					
ENERGY CONSERVATION MEASURES	**ANNUAL ENERGY SAVINGS ($)**	**PROJECT COST ($)**	**SMART START INCENTIVES**	**CUSTOMER COST**	**SIMPLE PAYBACK**
Lighting Upgrade	$2,561	$23,040	$4,199	$18,841	7.4
Lighting Controls	$2,516	$19,700	$3,050	$16,650	6.6
Condensing Unit Replacement	***$1,459***	***$48,005***	***$1,932***	***$46,073***	***31.6***
Rooftop Unit Replacement	***$2,745***	***$51,197***	***$2,500***	***$48,697***	***17.7***
Condensing Boiler Installation	$44,395	$818,850	$18,000	$800,850	18.0
NEMA Premium Motors	$863	$10,804	$550	$10,254	11.9
Demand Controlled Ventilation	$4,465	$62,000	$0	$62,000	13.9
NOT USED	-	-	-	-	-
Valve and Pipe Insulation	$843	$7,550	$0	$7,550	9.0
HW VFD Pumping	$9,903	$117,000	$0	$117,000	11.8
Window Replacement	***$19,430***	***$750,000***	***$0***	***$750,000***	***38.6***
Kitchen Hood Controls	$1,465	$17,993	$108	$17,885	12.2
DDC Controls Upgrade	***$28,836***	***$757,141***	***$0***	***$757,141***	***26.3***
Domestic HWH Replacement	$4,501	$57,565	$1,800	$55,765	12.4
Vending Machine Controls	$415	$337	$0	$337	0.8
Geothermal HP System	***$132,043***	***$5,001,512***	***$472,500***	***$4,529,012***	***34.3***
Water Conservation	$7,899	$86,196	$0	$86,196	10.9
Design / Construction Extras (15%)		$183,155		$183,155	-
Total Project	**$79,826**	**$1,404,190**	**$27,707**	**$1,376,483**	**17.2**

* Highlighted ECMs are not included within the project totals

Design / Construction Extras is shown as an additional cost for the facility project summary. This cost is included to estimate the costs associated with construction management fees for a larger combined project.

ECM #1: Lighting Upgrade – Interior spaces

Description:

The majority of the interior lighting throughout Brick Township High School is provided with a combination of fluorescent fixtures with 34W T12 lamps and magnetic ballasts and 32W T8 lamps with electronic ballasts. CEG recommends, re-lamping all of the T12 fixtures with 28W T8 lamps and replacing the magnetic ballasts with new, more efficient electronic ballasts.

The ECM includes retrofit of all older fluorescent fixtures with T8 or T5 fluorescent fixtures with electronic ballasts in the building. The new, energy efficient T8 fixtures will provide adequate lighting and will save on electrical costs due to better performance of the lamp and ballasts. This ECM also includes maintenance savings through the reduced number of lamps replaced per year. The expected lamp life of a T8 lamp is approximately 30,000 burn-hours, in comparison to the existing T12 lamps which is approximately 20,000 burn-hours. The facility will need approximately 33% less lamps replaced per year for each one for one fixture replaced.

In addition this ECM includes retrofit of the existing metal halide fixtures within the large spaces such as the gymnasium. The facility utilizes large metal halide fixtures which provide a reasonably efficient option for bay lighting however a few draw-backs that are common. Metal halide fixtures often have poor overall efficacy which limits the amount of light actually leaving the fixture. Also metal halide lamps require a significant warm-up period and even longer cool down period eliminating the potential for occupancy sensors frequent switching. This symptom encourages the gymnasium lighting to be left on continuously during the day. Another drawback is the reduced lumen output (Lumen Maintenance) of the metal halide bulb over its life time. Average bulb output or "mean lumens," is approximately 25% less than the bulb's initial lumens for typical metal halide lamps. In addition the most rapid rate of light output decline is during the beginning of its life, approximately 15-20% light loss within the first 20% of its rated life. It is important to note that the light loss has no savings in energy used; therefore the overall light efficiency is continuously decreasing with age. The final drawback is the light quality or Color Rendering Index (CRI). Typical values for metal halide bulbs is 65, which is a measure of how close the light is to true "full spectrum" light produced by sunlight or incandescent lighting. Metal halide bulbs also show noticeable color shifting when the bulb is reaching the end of its life.

This ECM includes replacement of each of the high bay metal halide light fixtures with T5HO fixtures with reflective lenses. The retrofit for the metal halide fixtures includes a one for one fixture replacement. The fluorescent fixtures selected will provide equivalent light compared to the average light output of the existing metal halide fixtures. The bulb replacement cost for T-5 HO lamps compared to the existing metal halide lamps were found to be approximately equal and therefore not included in the savings calculations.

The ECM also includes replacement of any incandescent lamps with compact fluorescent lamps. Compact fluorescent lamps (CFL's) were designed to be direct replacements for the standard incandescent lamps which are common to table lamps, spot lights, hi-hats, bathroom vanity lighting, etc. The light output of the CFL has been designed to resemble the incandescent lamp.

The color rendering index (CRI) of the CFL is much higher than standard fluorescent lighting, and therefore provides a much "truer" light. The CFL is available in a myriad of shapes and sizes depending on the specific application. Typical replacements are: a 13-Watt CFL for a 60-Watt incandescent lamp, an 18-Watt CFL for a 75-Watt incandescent lamp, and a 26-Watt CFL for a 100-Watt incandescent lamp. The CFL is also available for a number of "brightness colors" that is indicated by the Kelvin rating. A 2700K CFL is the "warmest" color available and is closest in color to the incandescent lamp. CFL's are also available in 3000K, 3500K, and 4100K. The 4100K would be the "brightest" or "coolest" output. A CFL can be chosen to screw right into your existing fixtures, or hardwired into your existing fixtures. Where the existing fixture is controlled by a dimmer switch, the CFL bulb must be compatible with a dimmer switch. In some locations the bulb replacement will need to be tested to make sure the larger base of the CFL will fit into the existing fixture. The energy usage of an incandescent compared to a compact fluorescent approximately 3 to 4 times greater. In addition to the energy savings, compact fluorescent fixtures burn-hours are 8 to 15 times longer than incandescent fixtures ranging from 6,000 to 15,000 burn-hours compared to incandescent fixtures ranging from 750 to 1000 burn-hours. However, the maintenance savings due to reduced lamp replacement is offset by the higher cost of the CFL's compared to the incandescent lamps.

Energy Savings Calculations:

The **Investment Grade Lighting Audit Appendix** outlines the hours of operation, proposed retrofits, costs, savings, and payback periods for each set of fixtures in the each building.

Rebates and Incentives:

$$\text{Smart Start Incentive} = \#\ \text{T12 to T8 Fixtures Retrofitted} \times \$10\ \text{Incentive per Fixture}$$

$$\text{Smart Start Incentive} = \#\ 175\text{W} - 249\text{W MH Fixtures Replaced} \times \$43\ \text{Incentive per Fixture}$$

Replacement and Maintenance Savings:

The maintenance savings available for this ECM is based on the a reduced number of fluorescent lamps replaced each year due to the extended life of T-8 Lamps over T-12 Lamps. The savings is calculated as Follows:

$$\text{Maintenance Savings} = \frac{\#\ \text{T12 Lamps Replaced}}{\text{Year}} - \frac{\#\ \text{T8 Lamps Replaced}}{\text{Year}} \times \text{Lamp Installed Cost}$$

Lamp installation cost is estimated to be $7 per lamp ($3 Material cost)

Energy Savings Summary:

ECM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$23,040
NJ Smart Start Equipment Incentive ($):	$4,199
Net Installation Cost ($):	$18,841
Maintenance Savings ($/Yr):	$45
Energy Savings ($/Yr):	$2,516
Total Yearly Savings ($/Yr):	$2,561
Estimated ECM Lifetime (Yr):	15
Simple Payback	7.4
Simple Lifetime ROI	103.9%
Simple Lifetime Maintenance Savings	$675
Simple Lifetime Savings	$38,415
Internal Rate of Return (IRR)	11%
Net Present Value (NPV)	$11,732.05

ECM #2: Lighting Controls Upgrade – Occupancy Sensors

Description:

Some of the lights in the school building are left on unnecessarily. In many cases the lights are left on because of the inconvenience to manually switch lights off when a room is left or on when a room is first occupied. This is common in rooms that are occupied for only short periods and only a few times per day. In some instances lights are left on due to the misconception that it is better to keep the lights on rather than to continuously switch lights on and off. Although increased switching reduces lamp life, the energy savings outweigh the lamp replacement costs. The payback timeframe for when to turn the lights off is approximately two minutes. If the lights are expected to be off for at least a two minute interval, then it pays to shut them off.

Lighting controls come in many forms. Sometimes an additional switch is adequate to provide reduced lighting levels when full light output is not needed. Occupancy sensors detect motion and will switch the lights on when the room is occupied. Occupancy sensors can either be mounted in place of a current wall switch, or on the ceiling to cover large areas.

The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the report:

- Occupancy Sensors for Lighting Control 20% - 28% energy savings.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 20% of the total light energy controlled by occupancy sensors and daylight sensors (The majority of the savings is expected to be after school hours when rooms are left with lights on)

This ECM includes installation of ceiling or switch mount sensors for individual offices, classrooms, large bathrooms, and libraries. Sensors shall be manufactured by Sensorswitch, Watt Stopper or equivalent. The **Investment Grade Lighting Audit Appendix** of this report includes the summary of lighting controls implemented in this ECM and outlines the proposed controls, costs, savings, and payback periods. The calculations adjust the lighting power usage by the applicable percent savings for each area that includes lighting controls.

Energy Savings Calculations:

$$\text{Energy Savings} = (\%\ \text{Savings} \times \text{Controlled Light Energy}\ (\text{kWh/Yr}))$$

$$\text{Savings.} = \text{Energy Savings}(\text{kWh}) \times \text{Ave Elec Cost}\left(\frac{\$}{\text{kWh}}\right)$$

Rebates and Incentives:

From the **NJ Smart Start® Program Incentives Appendix**, the installation of a lighting control device warrants the following incentive:

Smart Start Incentive
$= (\#\ \text{Wall mount sensors} \times \$20\ \text{per sensor})$
$+ (\#\ \text{Ceiling mount sensors} \times \$35\ \text{per sensor})$

Energy Savings Summary:

ECM #2 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$19,700
NJ Smart Start Equipment Incentive ($):	$3,050
Net Installation Cost ($):	$16,650
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,516
Total Yearly Savings ($/Yr):	$2,516
Estimated ECM Lifetime (Yr):	15
Simple Payback	6.6
Simple Lifetime ROI	126.7%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$37,740
Internal Rate of Return (IRR)	13%
Net Present Value (NPV)	$13,385.84

ECM #3: Split System Unit Upgrades

Description:

Brick Township High School is air conditioned by split system AC units. The majority of the units at the school are in fair condition and they have surpassed the end of their useful life of 15 years, which is defined by ASHRAE. The units currently installed are inefficient compared to modern equipment and can be replaced with new high efficiency units. New air conditioners provide higher full load and part load efficiencies due to advances in inverter motor technologies, heat exchangers and refrigerants.

This ECM includes one-for-one replacement of the older air conditioning units with new higher efficiency systems. It is recommended to fully evaluate the capacity needed for all new systems prior to moving forward with this ECM. A summary of the unit replacements for this ECM can be found in the table below:

IMPLEMENTATION SUMMARY					
ECM INPUTS	**SERVICE FOR**	**NUMBER OF UNITS**	**COOLING CAPACITY, BTU/HR**	**TOTAL CAPACITY, TONS**	**REPLACE UNIT WITH**
SS	Faculty Room	2	18,000	3.0	Carrier - 24APA5
SS	East Gym Office	1	12,000	1.0	Carrier - 24APA5
SS	East Gym Office	1	24,000	2.0	Carrier - 24ANA1-FE4ANF003
SS	Room 402	1	36,000	3.0	Carrier - 24ANA1-FE4ANB006
SS	Walk in Refrigerator	1	24,000	2.0	Carrier - 24ANA1-FE4ANF003
SS	Main Office	2	60,000	10.0	Carrier - 24ANA1-FE4ANB006
Total		**8**	**174,000**	**21.0**	

The manufacturers used as the basis for design are Carrier and Trane. All units are one for one style replacements with matching capacity of the new units to the old units.

Energy Savings Calculations:

Cooling Energy Savings:

Seasonal energy consumption of the air conditioners at the cooling mode is calculated with the equation below:

$$\text{Energy Savings, kWh} = \text{Cooling Capacity,} \frac{\text{BTU}}{\text{Hr}} \times \left(\frac{1}{\text{SEER}_{\text{Old}}} - \frac{1}{\text{SEER}_{\text{New}}} \right) \times \frac{\text{Operation Hours}}{1000 \frac{\text{W}}{\text{kWh}}}$$

$$\text{Demand Savings, kW} = \frac{\text{Energy Savings (kWh)}}{\text{Hours of Cooling}}$$

$$\text{Cooling Cost Savings} = \text{Energy Savings, kWh} \times \text{Cost of Electricity}\left(\frac{\$}{\text{kWh}}\right)$$

ENERGY SAVINGS CALCULATIONS							
ECM INPUTS	**COOLING CAPACITY, BTU/Hr**	**ANNUAL COOLING HOURS**	**EXISTING UNITS (S)EER**	**SPLIT UNITS (S)EER**	**# OF UNITS**	**ENERGY SAVINGS kWh**	**DEMAND SAVINGS kW**
SS	18,000	1,300	9 EER	13.2 EER	2	1,655	1.3
SS	12,000	1,300	9 EER	13.2 EER	1	552	0.4
SS	24,000	1,300	9 EER	14.4 EER	1	1,300	1.0
SS	36,000	1,300	9 EER	14.6 EER	1	1,995	1.5
SS	24,000	1,300	9 EER	14.4 EER	1	1,300	1.0
SS	60,000	1,300	9.2 EER	12.2 EER	2	4,170	3.2
Total					8	10,970	8.4

Project Cost, Incentives and Maintenance Savings

From the NJ Smart Start® Program appendix, the replacement of split system AC units and unitary systems with high efficiency AC systems falls under the category "Unitary HVAC Split System" and warrants an incentive based on efficiency (EER/SEER). The program incentives are calculated as follows:

$$\text{SmartStart® Incentive} = (\text{Cooling Tons} \times \$/\text{Ton Incentive})$$

SPLIT SYSTEM AC UNITS REBATE SUMMARY				
UNIT DESCRIPTION	**UNIT EFFICIENCY**	**REBATE $/TON**	**PROPOSED CAPACITY TONS**	**TOTAL REBATE $**
≥20 to 30 tons	10.5 EER	79	0	$0
≥ 11.25 to < 20 tons	11.5 EER	79	0	$0
≥ 5.4 to < 11.25 tons	11.5 EER	73	0	$0
5.4 tons or less Unitary AC and Split System	≥14 SEER	$92	21	$1,932
TOTAL			**21**	**$1,932**

Summary of cost, savings and payback for this ECM is below.

COST & SAVINGS SUMMARY							
ECM INPUTS	**INSTALLED COST**	**# OF UNITS**	**TOTAL COST**	**REBATES**	**NET COST**	**ENERGY SAVING**	**PAY BACK YEARS**
SS	$4,058	2	$8,116	$276	$7,840	$220	35.6
SS	$2,639	1	$2,639	$92	$2,547	$73	34.7
SS	$6,000	1	$6,000	$184	$5,816	$173	33.6
SS	$7,250	1	$7,250	$276	$6,974	$265	26.3
SS	$6,000	1	$6,000	$184	$5,816	$173	33.6
SS	$9,000	2	$18,000	$920	$17,080	$555	30.8
Total	$34,947	8	$48,005	$1,932	$46,073	$1,459	31.6

There is no significant maintenance savings due to implementation of this ECM.

Energy Savings Summary:

ECM #3 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$48,005
NJ Smart Start Equipment Incentive ($):	$1,932
Net Installation Cost ($):	$46,073
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,459
Total Yearly Savings ($/Yr):	$1,459
Estimated ECM Lifetime (Yr):	15
Simple Payback	31.6
Simple Lifetime ROI	-52.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$21,885
Internal Rate of Return (IRR)	-8%
Net Present Value (NPV)	($28,655.55)

ECM #4: RTU Unit Upgrades

Description:

Brick Township High School uses Rooftop Units for air condition and heating. The majority of the units at the school are in good condition and within their useful life of 15 years, which is defined by ASHRAE. The unit serving the Auditorium has exceeded its service life. The other units will reach the end of their useful life in the near future, and can be replaced with newer, more reliable, and efficient units. The units currently installed are inefficient compared to modern equipment and can be replaced with new high efficiency units. New air conditioners provide higher full load and part load efficiencies due to advances in inverter motor technologies, heat exchangers and refrigerants.

This ECM includes one-for-one replacement of the older air conditioning units with new higher efficiency systems. It is recommended to fully evaluate the capacity needed for all new systems prior to moving forward with this ECM. A summary of the unit replacements for this ECM can be found in the table below:

IMPLEMENTATION SUMMARY					
ECM INPUTS	**SERVICE FOR**	**NUMBER OF UNITS**	**COOLING CAPACITY, BTU/HR**	**TOTAL CAPACITY, TONS**	**REPLACE UNIT WITH**
RTU	Weight Room	1	240,000	20.0	Carrier Centurion 48PG
RTU	West Faculty Dining	1	48,000	4.0	Carrier Infinity 48XL-A 48090
RTU	Auditorium	1	324,000	27.0	Trane Intellipak
RTU	Classroom 117	1	36,000	3.0	Carrier Infinity 48XL-A 36060
RTU	Classroom 121	1	36,000	3.0	Carrier Infinity 48XL-A 36060
Total		**5**	**648,000**	**54.0**	

The manufacturers used as the basis for design are Carrier and Trane. All units are one for one style replacements with matching capacity of the new units to the old units.

Energy Savings Calculations:

Cooling Energy Savings:

Seasonal energy consumption of the air conditioners at the cooling mode is calculated with the equation below:

$$\text{Energy Savings, kWh} = \text{Cooling Capacity,} \frac{\text{BTU}}{\text{Hr}} \times \left(\frac{1}{\text{SEER}_{\text{Old}}} - \frac{1}{\text{SEER}_{\text{New}}} \right) \times \frac{\text{Operation Hours}}{1000 \frac{\text{W}}{\text{kWh}}}$$

$$\text{Demand Savings, kW} = \frac{\text{Energy Savings (kWh)}}{\text{Hours of Cooling}}$$

$$\text{Cooling Cost Savings} = \text{Energy Savings, kWh} \times \text{Cost of Electricity}\left(\frac{\$}{\text{kWh}}\right)$$

ENERGY SAVINGS CALCULATIONS							
ECM INPUTS	**COOLING CAPACITY, BTU/Hr**	**ANNUAL COOLING HOURS**	**EXISTING UNITS (S)EER**	**SPLIT UNITS (S)EER**	**# OF UNITS**	**ENERGY SAVINGS kWh**	**DEMAND SAVINGS kW**
RTU	240,000	1,300	9 EER	11.6 EER	1	7,770	6.0
RTU	48,000	1,300	10 EER	11 EER	1	567	0.4
RTU	324,000	1,300	8.5 EER	10.4 EER	1	9,053	7.0
RTU	36,000	1,300	9 EER	12 EER	1	1,300	1.0
RTU	36,000	1,300	8 EER	12 EER	1	1,950	1.5
Total					4	18,690	14.4

Project Cost, Incentives and Maintenance Savings

From the NJ Smart Start® Program appendix, the replacement of split system AC units and unitary systems with high efficiency AC systems falls under the category "Unitary HVAC Split System" and warrants an incentive based on efficiency (EER/SEER). The program incentives are calculated as follows:

$$\text{Smart Start ® Incentive} = (\text{Cooling Tons} \times \$/\text{Ton Incentive})$$

RTU AC UNITS REBATE SUMMARY				
UNIT DESCRIPTION	**UNIT EFFICIENCY**	**REBATE $/TON**	**PROPOSED CAPACITY TONS**	**TOTAL REBATE $**
≥20 to 30 tons	10.5 EER	79	20	$1,580
≥ 11.25 to < 20 tons	11.5 EER	79	0	$0
≥ 5.4 to < 11.25 tons	11.5 EER	73	0.0	$0
5.4 tons or less Unitary AC and Split System	≥14 SEER	$92	10	$920
TOTAL			**30**	**$2,500**

Summary of cost, savings and payback for this ECM is below.

COST & SAVINGS SUMMARY							
ECM INPUTS	**INSTALLED COST**	**# OF UNITS**	**TOTAL COST**	**REBATES**	**NET COST**	**ENERGY SAVING**	**PAY BACK YEARS**
RTU	$4,058	1	$4,058	$1,580	$2,478	$1,033	2.4
RTU	$2,639	1	$2,639	$368	$2,271	$75	30.1
RTU	$26,000	1	$26,000	$0	$26,000	$1,204	21.6
RTU	$9,250	1	$9,250	$276	$8,974	$173	51.9
RTU	$9,250	1	$9,250	$276	$8,974	$259	34.6
Total	51,197	5	$51,197	$2,500	$48,697	$2,745	17.7

There is no significant maintenance savings due to implementation of this ECM.

Energy Savings Summary:

ECM #4 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$51,197
NJ Smart Start Equipment Incentive ($):	$2,500
Net Installation Cost ($):	$48,697
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$2,745
Total Yearly Savings ($/Yr):	$2,745
Estimated ECM Lifetime (Yr):	15
Simple Payback	17.7
Simple Lifetime ROI	-15.4%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$41,175
Internal Rate of Return (IRR)	-2%
Net Present Value (NPV)	($15,927.37)

ECM #5: Condensing Boiler Installation

Description:

Space heating for the perimeter offices and classrooms in the majority of the school is provided with unit ventilators and cabinet heaters with hot water coils and hot water radiators. The sources of hot water for these equipments are three (3) gas fired cast iron hot water boilers and two (2) gas fired steam boilers.

Three (3) of the boilers are 6.20 MMBH (10^6 BTU/H) H.B. Smith standard efficiency, sectional cast iron hot water boilers. These boilers are located in the West section boiler room and are in fair to poor condition. These boilers are 52 years old, which is well beyond their useful life of 30 years per ASHRAE. The other two (2) boilers are 3.5 MMBH H.B. Smith standard efficiency, cast iron steam boilers. These boilers are located in the East section mechanical room. These boilers are approximately 49 years old have also far surpassed their useful service life, per ASHRAE, and they are in fair to poor condition

Typically, standard (non-condensing) boilers provide lower than nominal efficiency compared to condensing boilers. Standard boilers suffer further efficiency losses at part load operating conditions mainly due to limitations in the reduction of the flue gas temperature. Current average combustion efficiency of the boilers is estimated to be 70% due to standard non-condensing boiler technology, limited turn down ratio, cycling losses and outdated design and controls. New condensing boilers could substantially improve the operating efficiency of the heating system of the building. Condensing boiler's peak efficiency tops out at 99% depending on return water temperature.

CEG recommends replacing the five (5) H.B. Smith boilers with condensing hot water boilers to provide building with heating throughout the year. The annual average operating efficiency of the proposed boiler set is expected to be 90%, which gives the heating system a 15% increase in efficiency. This ECM is based on variable supply water temperature adjusted based on outdoor temperature.

This ECM includes installation of four (4) new condensing gas fired boilers to replace three (3) existing H.B. Smith boilers in the East mechanical room and two (2) new condensing gas fired boiler to replace the H.B. Smith boilers in the West mechanical room. The following is a summary of the boiler replacement recommendations.

BOILER REPLACEMENT SUMMARY		
EXISTING UNIT	**LOCATION**	**PROPOSED UNITS**
(3) 6.2 MMBH Cast Iron Boilers	West Boiler Room	(4) 3.0 MMBTU
(2) 3.5 MMBH Cast Iron Boiler	East Boiler Room	(2) 3.0 MMBTU

The basis for this ECM is Aerco Benchmark 3.0 condensing hot water boiler or equivalent. New boilers shall be setup and programmed to be the primary source of heating for the building during entire year. In addition to the boiler replacement, consideration was given to the costs associated with converting the existing steam boilers to hot water. In order for this conversion to be complete, the two (2) steam to hot water heat exchangers, located in the East mechanical room would be removed and the new boilers piped directly to the existing hot water loop. The owner is recommended to retain a professional engineer to confirm equipment sizing and finalize design.

Energy Savings Calculations:

Currently, the only other gas consuming equipment connected to the building gas meter is the boilers and a single rooftop unit, located over the weight room. Therefore, annual energy consumption of the boilers has to be estimated. In this calculation, it is assumed that the energy consumption of the boilers will be in proportion with the ratio of the total heating capacity of each equipment.

Below calculation is performed to estimate annual gas usage of the cast iron boilers:

Total facility heating capacity (Heating equipment output capacity):

(3) H.B. Smith cast iron hot water boilers	= 13,020 MBH
(2) H.B. Smith cast iron steam boilers	= 5,390 MBH
(1) Gas Fired RTUs (weight room)	= 72 MBH
Total Output Capacity	**= 18,482 MMBH**

Total facility heating capacity:	18,482 MBH
Total Capacity – Cast Iron Boilers only:	18,410 MBH
Percent usage by boilers:	99.6% of Total
Estimated natural gas usage	99.6% of 163,354 Therms
Estimated natural gas usage	162,718 Therms

$$\text{Bldg Heat Required} = \text{Heating Nat. Gas (Therm)} \times \text{Heating Eff (\%)} \times \text{Fuel Heat Value } (\frac{\text{BTU}}{\text{Therm}})$$

$$\text{Proposed Heating Gas Usage} = \frac{\text{Bldg. Heat Required (BTU)}}{\text{New Heating Eff (\%)} \times \text{Fuel Heat Value } (\frac{\text{BTU}}{\text{Therm}})}$$

$$\text{Energy Cost} = \text{Heating Gas Usage (Therms)} \times \text{Ave Fuel Cost } (\frac{\$}{\text{Therm}})$$

Energy savings calculations are summarized in the table below:

CONDENSING BOILER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Hot Water Boilers	New Condensing Boilers	-
Existing Nat Gas (Therms)	162,718	-	-
Boiler Efficiency (%)	70%	90%	20%
Nat Gas Heat Value (BTU/Therm)	100,000	100,000	-
Equivalent Building Heat Usage (MMBTUs)	11,390	11,390	-
Ave. Gas Cost ($/Therm) (Heating season only)	1.24	1.24	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Natural Gas Usage (Therms)	162,718	126,558	36,160
Energy Cost ($)	$199,780	$155,384	$44,395
COMMENTS:			

Project Cost, Incentives and Maintenance Savings

Estimated cost for removing the existing boilers, piping and steam to hot water heat exchangers and installing six (6) 3.0 MMBH condensing hot water boilers with advanced controls is $818,850.

From the **New Jersey Smart Start® Program Incentives Appendix**, installation of a high efficiency hot water boiler falls under the category "Gas Heating" and warrants an incentive based on efficiency at or above 84% for this type of equipment. The program incentives are calculated as follows:

GAS FIRED BOILER REBATE SUMMARY					
UNIT DESCRIPTION	**UNIT EFFICIENCY**	**REBATE $/MBH**	**PROPOSED CAPACITY, MBH**	**NUMBER OF UNITS**	**TOTAL REBATE, $**
>1500 - ≤ 4000 MBH	84% AFUE for Hot Water boilers	$1	3,000	6	$18,000
TOTAL					**$18,000**

Maintenance savings associated with this ECM is estimated to be minimal.

Energy Savings Summary:

ECM #5 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$818,850
NJ Smart Start Equipment Incentive ($):	$18,000
Net Installation Cost ($):	$800,850
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$44,395
Total Yearly Savings ($/Yr):	$44,395
Estimated ECM Lifetime (Yr):	30
Simple Payback	18.0
Simple Lifetime ROI	66.3%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$1,331,850
Internal Rate of Return (IRR)	4%
Net Present Value (NPV)	$69,311.59

ECM #6: Install NEMA Premium® Efficiency Motors

Description:

The improved efficiency of the NEMA Premium® efficient motors is primarily due to better designs with use of better materials to reduce losses. Surprisingly, the electricity used to power a motor represents 95 % of its total lifetime operating cost. Because many motors operate continuously 24 hours a day, even small increases in efficiency can yield substantial energy and dollar savings.

The electric motors driving the hot water pumps are candidates for replacing with premium efficiency motors. These standard efficiency motors run considerable amount of time over a year.

This energy conservation measure replaces existing inefficient electric motors with NEMA Premium® efficiency motors. NEMA Premium® is the most efficient motor designation in the marketplace today.

IMPLEMENTATION SUMMARY					
EQMT ID	**FUNCTION**	**MOTOR HP**	**HOURS OF OPERATION**	**EXISTING EFFICIENCY**	**NEMA PREMIUM EFFICIENCY**
HWP - 1	Hot Water Loop	7.5	4,300	86.5%	91.7%
HWP - 2	How Water Loop, Zone 1	1.5	4,300	82.0%	88.5%
HWP - 3	Hot Water Loop, Zone 3	7.5	4,300	86.5%	91.7%
HWP - 4	Hot Water Loop	10	4,300	87.5%	92.4%
HWP - 5	East Hot Water Loop	1	4,300	80.5%	87.5%
HWP - 6	East Hot Water Loop	1	4,300	80.5%	87.5%
HWP - 7	East Hot Water Loop	3	4,300	85.5%	89.5%
HWP - 8	East Hot Water Loop	3	4,300	85.5%	89.5%

Energy Savings Calculations:

$$\text{Electric usage, kWh} = \frac{\text{HP} \times \text{LF} \times 0.746 \times \text{Hours of Operation}}{\text{Motor Efficiency}}$$

where, HP = Motor Nameplate Horsepower Rating

LF = Load Factor Motor Efficiency = Motor Nameplate Efficiency

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric Usage Savings, kWh} = \text{Electric Usage}_{\text{Existing}} - \text{Electric Usage}_{\text{Proposed}}$$

$$\text{Electric cost savings} = \text{Electric Usage Savings} \times \text{Electric Rate}\left(\frac{\$}{\text{kWh}}\right)$$

The calculations were carried out and the results are tabulated in the table below:

PREMIUM EFFICIENCY MOTOR CALCULATIONS							
EQMT ID	**MOTOR HP**	**LOAD FACTOR**	**EXISTING EFFICIENCY**	**NEMA PREMIUM EFFICIENCY**	**POWER SAVINGS kW**	**ENERGY SAVINGS kWH**	**COST SAVINGS**
HWP - 1	7.5	90%	86.5%	91.7%	0.33	1,427	$190
HWP - 2	1.5	90%	82.0%	88.5%	0.09	390	$52
HWP - 3	7.5	90%	86.5%	91.7%	0.33	1,427	$190
HWP - 4	10	90%	87.5%	92.4%	0.41	1,759	$234
HWP - 5	1	90%	80.5%	87.5%	0.07	288	$38
HWP - 6	1	90%	80.5%	87.5%	0.07	288	$38
HWP - 7	3	90%	85.5%	89.5%	0.11	455	$61
HWP - 8	3	90%	85.5%	89.5%	0.11	455	$61
TOTAL					**1.5**	**6,490**	**$863**

Equipment Cost and Incentives

Below is a summary of SmartStart Building® incentives for premium efficiency motors:

INCENTIVES	
HORSE POWER	**NJ SMART START INCENTIVE**
1	$50
1.5	$50
2	$60
3	$60
5	$60
7.5	$90
10	$100
15	$115
20	$125
25	$130

The following table outlines the summary of motor replacement costs and incentives:

MOTOR REPLACEMENT SUMMARY						
EQMT ID	MOTOR POWER HP	INSTALLED COST	SMART START INCENTIVE	NET COST	TOTAL SAVINGS	SIMPLE PAYBACK
HWP - 1	7.5	$1,971	$90	$1,881	$190	9.9
HWP - 2	1.5	$788	$50	$738	$52	14.2
HWP - 3	7.5	$1,971	$90	$1,881	$190	9.9
HWP - 4	10	$2,560	$100	$2,460	$234	10.5
HWP - 5	1	$708	$50	$658	$38	17.2
HWP - 6	1	$708	$50	$658	$38	17.2
HWP - 7	3	$1,049	$60	$989	$61	16.3
HWP - 8	3	$1,049	$60	$989	$61	16.3
TOTAL	**Totals:**	**$10,804**	**$550**	**$10,254**	**$863**	**11.9**

Energy Savings Summary:

ECM #6 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$10,804
NJ Smart Start Equipment Incentive ($):	$550
Net Installation Cost ($):	$10,254
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$863
Total Yearly Savings ($/Yr):	$863
Estimated ECM Lifetime (Yr):	15
Simple Payback	11.9
Simple Lifetime ROI	26.2%
Simple Lifetime Maintenance Savings	0
Simple Lifetime Savings	$12,945
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	$48.44

ECM #7: Demand Controlled Ventilation – Gymnasium and Auditorium

Demand Controlled Ventilation (DCV) is a means to provide active, zone level control of ventilation for spaces within a facility. The basic premise behind DCV is monitoring indoor CO2 levels versus outdoor CO2 levels in order to provide proper ventilation to the spaces within the facility as well as saving costly dollars treating unconditioned ventilation air. Carbon dioxide ventilation control or demand controlled ventilation (DCV) allows for the measurement and control of outside air ventilation levels to a target cfm/person ventilation rate in the space (i.e., 15 cfm/person) based on the number of people in the space. It is a direct measure of ventilation effectiveness and is a method whereby buildings can regain active and automatic zone level ventilation control, without having to open windows. The fixed ventilation approach depends on a set-it-and-forget-it methodology that is completely unresponsive to changes in the way spaces are utilized/occupied or how equipment is maintained. A DCV system utilizes various control algorithms to maintain a base ventilation rate. The system monitors space CO2 levels and the algorithm automatically adjusts the outdoor and return air dampers to provide the quantity of outdoor air to maintain the required CO2 level in the space. System designs are normally designed for maximum occupancy and the ventilation rates are designed for this (maximum) occupancy. In areas where occupancy swings are prevalent there is ample opportunity to reduce outdoor air quantity to satisfy the needs of the actual number of occupants present. By installing the DCV controls, energy savings are realized by the reduced quantities of outdoor air that do not require heating and cooling energy from the steam and chilled water plants.

There are heating and ventilation units providing heating and ventilation to Gymnasiums and packaged rooftop VAV units provide heating and air conditioning to the auditorium. When operating, these units provide minimum amount of outside air to the space. The outside air volume is typically based on the maximum occupancy of the space conditioned. When a given space is not fully occupied the outside air quantity delivered to the space is greater than the amount needed for adequate ventilation.

This ECM includes the installation of CO_2 sensors integrated into a demand control ventilation system, for the units mentioned above. This system allows the air handling unit to respond to changes in occupancy and therefore reduce the amount of outside air that has to be conditioned. Outside air accounts for a large portion of the energy consumption in the HVAC system, especially in high occupancy spaces.

The components required for the demand control ventilation system installation include damper actuators, Variable Frequency Drives, CO2 sensors, wiring, Energy Management System equipment expansion and programming. Each occupied zone would require minimum one CO_2 sensor installed to monitor occupancy levels.

Often heating and air conditioning units switch to occupied mode several hours before the actual occupancy in order to provide pre-heating or pre-cooling of the space. Energy savings achieved through “Demand Control Ventilation” is calculated based on actual occupancy of the spaces and the hours the units are in occupied mode.

Energy Savings Calculations:

Following table summarizes the estimated occupancy characteristics of the spaces and the HVAC equipment at this school.

ENERGY SAVINGS	
ECM INPUTS	**DCV**
Average Full Occupancy Hours	8:00 AM - 1:00 PM
Full Occupancy Hours per Day	5
HVAC Eqp. On Occupied Mode	7:00 AM - 5:00 PM
Occupied Hours per day	10
HVAC occupied / spaces not occupied	5
Est. Conditioned outside air savings	50%

Following is a list of HVAC equipment and corresponding spaces identified for Demand Controlled Ventilation.

IMPLEMENTATION SUMMARY							
INPUTS	**Service**	**# of CO2 SENSORS**	**HVAC Unit Type**	**Total Cooling Capaity, Tons**	**Total Heating Capaity, Mbh**	**Outside Air Cooling, Tons**	**Outside Air Heating, MBH**
DCV-1	East Gym Boys	1	HV	-	702	-	211
DCV-2	East Gym Girls	1	HV	-	702	-	211
DCV-3	Boys Aux. Gym	1	HV	-	140	-	42
DCV-4	Girls Aux. Gym	1	HV	-	140	-	42
DCV-5	West Gym Boys	1	HV	-	702	-	211
DCV-6	West Gym Girls	1	HV	-	702	-	211
DCV-7	Auditorium	1	RTU	27	11	8.1	3
DCV-8	Auditorium	1	RTU	27	11	8.1	3
Total		**8**				**16**	**933**

Assumptions: 400 CFM/Ton, 30% average fresh air, 65°F design day ΔT

Total heating capacity estimated based on each unit with 10,000 CFM flow capacity in Main Gyms and 2,000 CFM in Aux. Gym.

Max outside air heating capacity = 1.08 x Fresh Air CFM x design day ΔT

$$\text{Cooling Energy Usage} = \frac{\text{Cooling}(\text{Tons}) \times 12{,}000 \left(\frac{\text{Btu}}{\text{Ton hr}} \right) \times \text{Annual Full Load Cooling Hrs.}}{1000 \left(\frac{\text{Wh}}{\text{kWh}} \right) \times \text{EER} \left(\frac{\text{Btu}}{\text{Wh}} \right)}$$

$$\text{Cooling Cost} = \text{Energy Usage}(\text{kWh}) \times \text{Ave Electric Cost} \left(\frac{\$}{\text{kWh}} \right)$$

$$\text{Heating Energy (Therms)} = \frac{\text{Outside Air Heating Capacity} \left(\frac{\text{Btu}}{\text{Hr.}} \right) \times \text{HDD}(\text{Day °F}) \times 12 \left(\frac{\text{Hr.}}{\text{Day}} \right) \times (0.60)}{65(\text{°F}) \times \text{Fuel Heat Value} \left(\frac{\text{Btu}}{\text{Therms}} \right) \times \text{Heating Efficiency (\%)}}$$

$$\text{Heating Cost} = \text{Heating Energy}(\text{Therms}) \times \text{Ave Fuel Cost} \left(\frac{\$}{\text{Therms}} \right)$$

DEMAND CONTROLLED VENTILATION	
ECM INPUTS	**DCV**
Equipment	Gym HVUs and Auditorium RTUs
OA Cooling Capacity, Tons	16
Average Efficiency (EER)	8.5
Annual Full Load Cooling Hours	800
OA Heating Capacity, MBh	933
Net Heating Efficiency (Gas)	75%
Heating Degree Days (65°F)	4599
Occupied Hours per day	10
Heating Energy Saving	50%
A/C Energy Savings	50%
Elec Cost ($/kWh)	$0.133
Natural Gas Cost ($/Therm)	$1.23
ENERGY SAVINGS	
ECM RESULTS	**DCV**
Cooling Energy Cnsmption, kWh	18,296
Heating Energy (Therms)	5,282
Cooling Energy Savings kWh	9,148
Heating Energy Savings (Therms)	2,641
Electric Energy Cost Savings ($)	$1,217
Total Gas Cost Savings ($)	$3,248
Total Cost Savings ($)	$4,465
COMMENTS:	HDD estimated based on Newark Liberty Airport OA: Outside Air

Cost and Incentives:

Estimated installed cost for demand controlled ventilation for the Gymnasium is $110,000. Estimated cost includes CO2 sensors, control wiring, electrical wiring, control system equipment expansion and programming.

There are currently no Smart Start ® incentives available for a Demand Control Ventilation System.

Energy Savings Summary:

ECM #7 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$62,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$62,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$4,465
Total Yearly Savings ($/Yr):	$4,465
Estimated ECM Lifetime (Yr):	15
Simple Payback	13.9
Simple Lifetime ROI	8.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$66,975
Internal Rate of Return (IRR)	1%
Net Present Value (NPV)	($8,697.12)

ECM #9: Valve Blanket and Pipe Insulation

Description:

The old boiler plant supplies heating hot water to the facility for heating season. The piping remains heated at approximately 180°F continuously during this period (approximately 6 months). Un-insulated piping has significant heat losses due to the exposure of the steel piping to the surrounding air. Insulated piping has a heat loss which is a small fraction of the heat loss from un-insulated piping. It was noted that significant piping within the boiler room was missing piping insulation including numerous valves throughout the system.

Based on the site survey approximately (5) - 6" Gate valves, (6) - 3" Gate valves, (4) – 2.5" Gate valves, and (11) – 2.5" Strainer valves. Valve blankets are designed to provide insulation value over large hydronic valves that must remain accessible. This ECM includes installation of valve blankets on all exposed boiler system valves and insulation of all un-insulated piping and exposed components within the boiler room.

Energy Savings Calculations:

Heat Loss for un-insulated steel piping is based on ASHRAE 2009 Fundamentals – "Insulation for Mechanical Systems"

Bare Steel Piping Heat Loss 8" pipe: 486 BTU/HR per Linear FT

$$\text{Heat Loss}\,\frac{\text{BTU}}{\text{HR}}\,\text{per Linear FT} = \frac{1}{\text{R} - \text{Value}} \times \text{Pipe Dia (FT)} \times 3.14 \times (\text{Pipe Temp (°F)} - \text{Ambient Temp(°F)})$$

$$\text{Heat Loss}\,\frac{\text{BTU}}{\text{HR}} = \text{Heat Loss}\,\frac{\text{BTU}}{\text{HR}}\,\text{per Linear FT} \times \text{Length of Uninsulated Pipe}$$

$$\text{Energy Use, Therms} = \frac{\text{Heat Loss}\,\frac{\text{BTU}}{\text{HR}} \times \text{Operating Hrs}}{\text{Heating System Eff. (\%)} \times \text{Fuel Heat Value}\,\frac{\text{BTU}}{\text{Therm}}}$$

$$\text{Heating Energy Cost Savings} = \text{Energy Use, Therms} \times \text{Cost of Nat Gas}\left(\frac{\$}{\text{Therm}}\right)$$

VALVE BLANKET INSULATION CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Bare Pipe	Insulation Blanket	
Length of Un-Insulated Pipe Including Valves	26	26	
Blanket Insulation R-value	0	6	6
Temperature Difference Pipe to Ambient (°F)	100	100	
Pipe Heat Loss - 8" Pipe (BTU/Hr per FT)	486	35	451
Heat Loss (BTU/Hr)	12,636	907	11,729
Heating System Operating Hrs	4380	4380	
Energy Loss (kBtus)	55,346	3,973	51,373
Heating System Eff (%)	75%	75%	
Fuel Heat Value (BTU/Therm)	100,000	100,000	
Nat Gas Cost ($/Therm)	1.23	1.23	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Nat Gas Usage Usage (Therms)	738	53	685
Energy Cost ($)	$908	$65	$843
COMMENTS:	Bare Pipe Heat Loss value is based on ASHRAE 2009 Fundamentals "Insulation for Mechanical Systems"		

There is no maintenance savings due to implementation of this ECM.

Energy Savings Summary:

ECM #9 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$7,550
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$7,550
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$843
Total Yearly Savings ($/Yr):	$843
Estimated ECM Lifetime (Yr):	15
Simple Payback	9.0
Simple Lifetime ROI	67.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$12,645
Internal Rate of Return (IRR)	7%
Net Present Value (NPV)	$2,513.68

ECM #10: Install HW Pump VFD's

Description:

The heating and ventilation units and the unit ventilators are utilizing a constant volume pumping design.

2-way control valves provide flow through the heat exchanger equipment only when there is a call for heating or cooling, unlike 3-way control valves that allow constant flow of the water loop. 3-way control valves require full pumping energy continuously, while 2-way control valves allow the system to reduce flow when it is not needed. This measure includes capping off the bypass port on the 3-way control valves which effectively turns the valves into "2-way" control valves. When the unit is not calling for heating, the control valve closes reducing overall flow of the system. Variable frequency drives allow the pumps to slow down in response to a reduction in overall system flow. The reduction in operating flow allows the pumps to reduce energy consumption for all hours that the heating system is not at its peak load.

This ECM includes the installation of Variable Frequency Drives on the four (4) existing pumps within the main boiler room as well as the four (4) existing pumps in the East section boiler room. To control flow through the system, this ECM includes piping modifications at the H&V units and unit ventilators to cap off the bypass port on the 3-way control valves. The VFD's would be controlled by a differential pressure sensor in the water loop to measure demand for water (typical for each of the three pump sets). The furthest unit from the loop pumps would remain as 3-way control valves (constant flow) to eliminate dead heading potential. This ECM also includes replacement of the existing pump motors with inverter duty motors that meet NEMA Premium Efficiency Standard, which also helps to reduce energy consumption.

Energy and cost savings calculations are based on calculation software "PumpSave v4.2," provided by ABB. The PumpSave calculation software is used to estimate the pumping energy for variable speed pump systems. The boiler water loop pumps operate approximately 4,320 Hrs per year since this system is used for about 6 month's total. The pump flow, HD, and resultant energy are calculated based on the existing pump horse power installed. The calculation is based on all existing equipment to be modified to operate as 2-way control valves. Where control valves are already 2-way style, these control valves shall remain. The exact quantity of equipment with hot water coils is unknown. The operation of all equipment control valves should be verified before implementing this ECM.

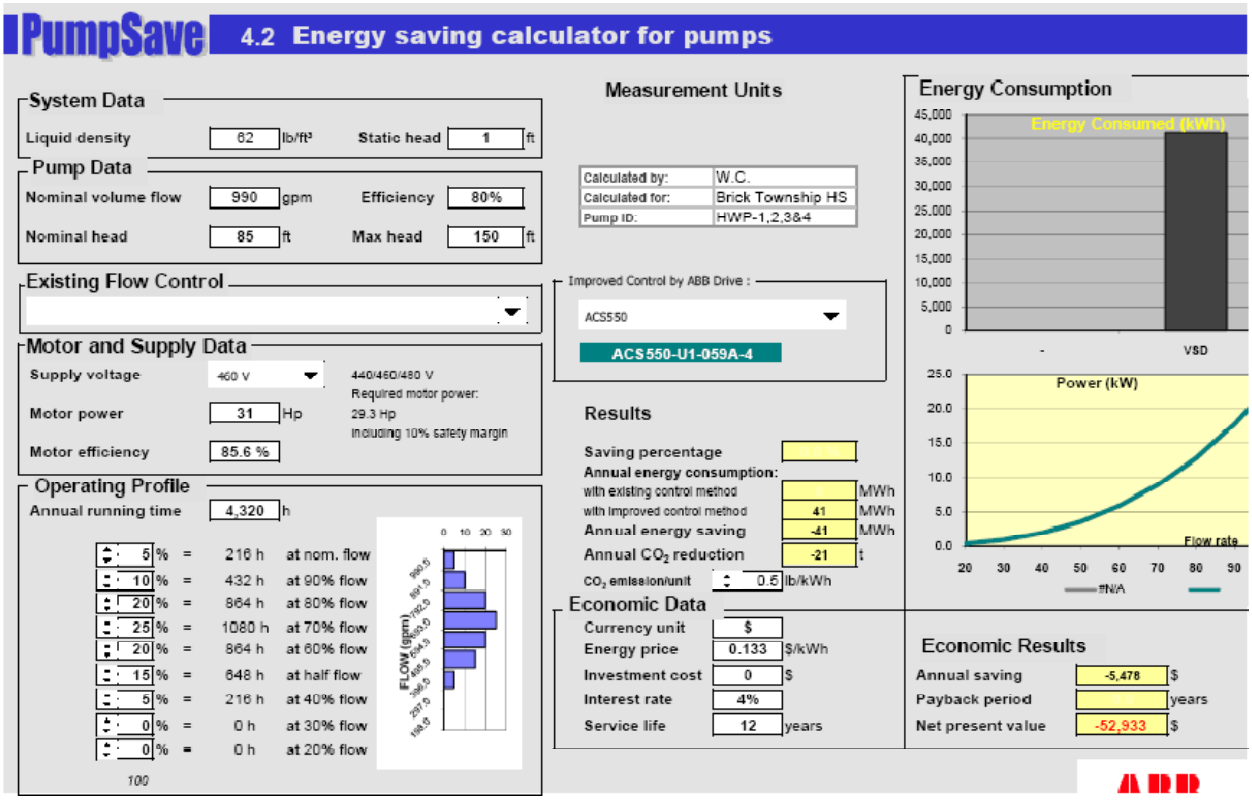
Energy Savings Calculations:

$$\text{Cons. Volume Power}\left(\text{HP}\right) = \frac{\text{Specific Gravity} \times \text{Flow Rate}\left(\frac{\text{Gal}}{\text{min}}\right) \times \text{Head}\left(\text{Ft}\right)}{3960 \times \text{Pump Efficiency}\left(\%\right) \times \text{Motor Efficiency}\left(\%\right)}$$

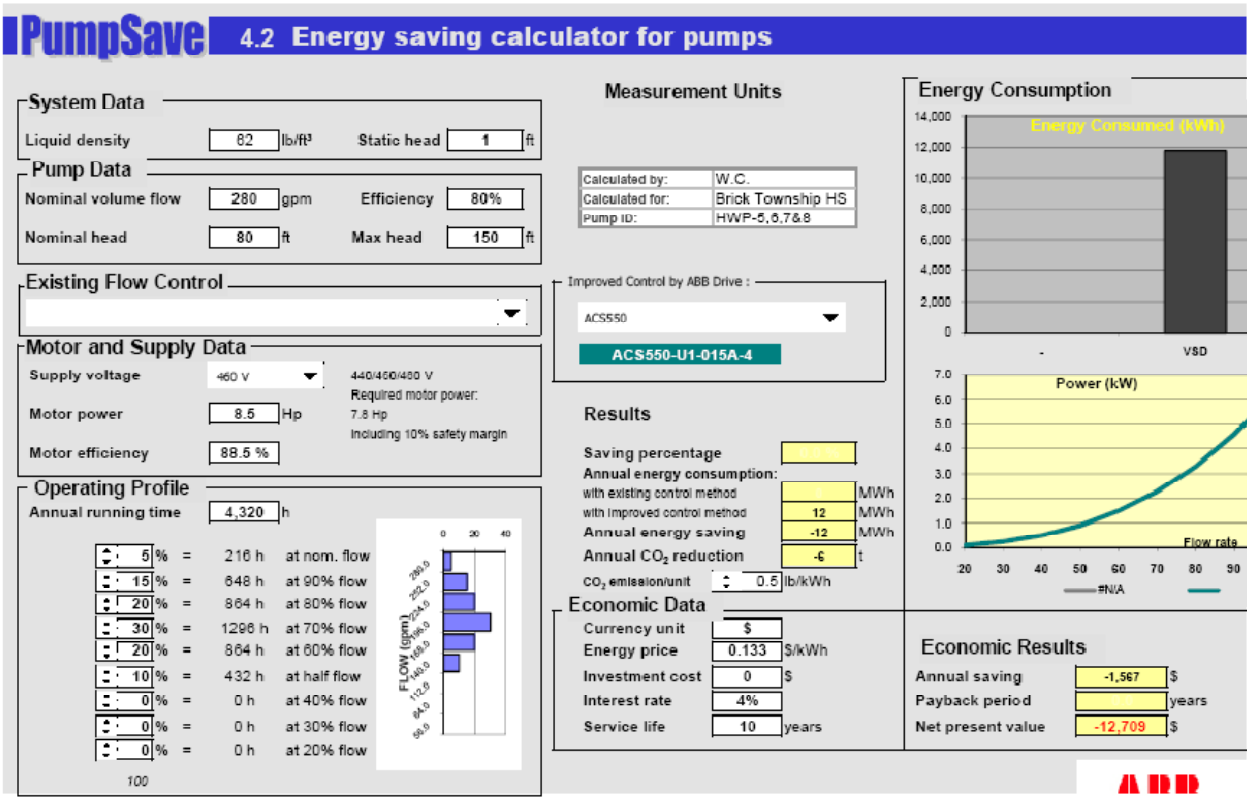
$$\text{Energy Cons.}(\text{kWh}) = \text{Power}(\text{HP}) \times 0.746\left(\frac{\text{KW}}{\text{HP}}\right) \times \text{Operation}(\text{Hrs.})$$

$$\text{Energy Cost} = \text{Energy Usage}(\text{kWh}) \times \text{Ave Electric Cost}\left(\frac{\$}{\text{kWh}}\right)$$

Main Boiler Room - Hot Water VFD Pumping Energy:



West Boiler Room - Hot Water VFD Pumping Energy:



MAIN BOILER ROOM HOT WATER PUMPS VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	CV Pumps	VFD Pumps	
Flow Control	CV	VFD	-
Total Flow* (GPM)	990	990	-
Head* (Ft)	85	85	-
Pump Efficiency (%)	80%	80%	-
Ave. Motor Efficiency (%)	85.6%	91.1%	5.5%
Operating Hrs	4320	4320	-
Estimated Total Horse Power	31.0	29.2	1.86
Elec Cost ($/kWh)	0.133	0.133	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	99,975	41,186	58,789
Electric Energy Cost ($)	$13,297	$5,478	$7,819
COMMENTS:	- VFD pump energy is based on ABB energy savings calculator for pumps, "Pump Save," version 4.2. Flow rate for VFD Pump calculation is summarized in the operating profile shown in the Pump Save output. - Hot water flow & head estimated based on pump horse power.		

ORIGINAL BOILER ROOM HOT WATER PUMPS VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	CV Pumps	VFD Pumps	
Flow Control	CV	VFD	-
Total Flow* (GPM)	670	670	-
Head* (Ft)	95	95	-
Pump Efficiency (%)	80%	80%	-
Ave. Motor Efficiency (%)	88.5%	93.0%	4.5%
Operating Hrs	4320	4320	-
Estimated Total Horse Power	22.7	21.6	1.10
Elec Cost ($/kWh)	0.133	0.133	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	73,163	29,275	43,888
Electric Energy Cost ($)	$9,731	$3,894	$5,837
COMMENTS:	- VFD pump energy is based on ABB energy savings calculator for pumps, "Pump Save," version 4.2. Flow rate for VFD Pump calculation is summarized in the operating profile shown in the Pump Save output. - Hot water flow & head estimated based on pump horse power.		

EAST BOILER ROOM HOT WATER PUMPS VFD CALULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	CV Pumps	VFD Pumps	
Flow Control	CV	VFD	-
Total Flow* (GPM)	280	280	-
Head* (Ft)	80	80	-
Pump Efficiency (%)	80%	80%	-
Ave. Motor Efficiency (%)	83.0%	90.2%	7.2%
Operating Hrs	4320	4320	-
Estimated Total Horse Power	8.5	7.8	0.68
Elec Cost ($/kWh)	0.133	0.133	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy (kWh)	27,454	11,781	15,673
Electric Energy Cost ($)	$3,651	$1,567	$2,084
COMMENTS:	- VFD pump energy is based on ABB energy savings calculator for pumps, "Pump Save," version 4.2. Flow rate for VFD Pump calculation is summarized in the operating profile shown in the Pump Save output. - Hot water flow & head estimated based on information provided on pump tag.		

Installation cost for eight (8) VFDs, premium efficiency motors, piping work, re-balancing, capping of 3-way valves and controls is estimated to be $117,000.

Currently there are no **NJ Smart Start® Program Incentives** for installation of hot water pump Variable Frequency Drives.

Energy Savings Summary:

ECM #10 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$117,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$117,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$9,903
Total Yearly Savings ($/Yr):	$9,903
Estimated ECM Lifetime (Yr):	15
Simple Payback	11.8
Simple Lifetime ROI	27.0%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$148,545
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	$1,221.37

ECM #11: Window Replacement

Description:

The building envelope of Brick Township High School consists of single pane 1/4" glass with an aluminum frame. The majority of windows were installed in the original construction in 1958, with newer windows installed during the additions in 1961 and 1970.

These windows and frames are in fair to poor condition with some maintenance required. The windows account for energy use through infiltration leakage loss and conductive loss. This style of window construction allows higher infiltration energy loss where a replacement double pane window would reduce these losses. These factors lead to increased energy use in the heating and cooling seasons. The energy loss due to single pane clear glass in addition with the energy loss due to poor seals at each operable window can be reduced with new higher efficiency replacement windows.

New double pane casement windows with argon filled low E glazing offer a substantial improvement in thermal performance in both the summer and winter months. The school is open 10 months out of the year, and requires both a heating and cooling load. It would benefit in both the cooling and heating months of the year to replace the current windows.

This ECM includes the replacement of all existing windows in Brick Township High School building with double pane, argon filled low emissivity glass. The proposed windows would result in a reduction of outside air leakage. In addition the double pane structure will significantly increase the insulation value compared to the existing single pane, air filled clear window structure. The basis for this ECM is Anderson Windows at $75 per SF of window installed. It should be noted this ECM is based on replacement of all windows assuming they are all single pane. As well this ECM assumes the heating and cooling efficiencies that are in current use, if newer units are installed per the other ECM's the final amount of energy saved will vary accordingly.

Energy Savings Calculations:

$$\text{Infiltration}\left(\frac{\text{Ft}^3}{\text{Min.}}\right) = \frac{\text{Area}\left(\text{Ft}^2\right) \times \text{Ave Height}\left(\text{Ft}\right) \times \text{AirChanges Per Hour}\left(\frac{1}{\text{Hr.}}\right)}{60\left(\frac{\text{Min}}{\text{Hr.}}\right)}$$

$$\text{Heat Load}\left(\frac{\text{Btu}}{\text{Hr.}}\right) = 1.1 \times \text{Infiltration}\left(\frac{\text{Ft}^3}{\text{Min}}\right) \times \text{Design Temperature Difference}\left(^{\circ}\text{F}\right)$$

$$\text{Cooling Load}\left(\text{Ton}\right) = \text{Infiltration}\left(\frac{\text{Ft}^3}{\text{Min}}\right) \times \frac{1\,\text{Ton Cooling}}{400\left(\frac{\text{Ft}^3}{\text{Min}}\right)}$$

$$\text{Heating Leakage Energy}\left(\text{Therms}\right)=\frac{\text{Heat Load}\left(\frac{\text{Btu}}{\text{Hr.}}\right)\times\text{HDD}\left(\text{Day }^{\circ}\text{F}\right)\times 24\left(\frac{\text{Hr.}}{\text{Day}}\right)\times\left(0.60\right)}{65\left(^{\circ}\text{F}\right)\times\text{Fuel Heat Value}\left(\frac{\text{Btu}}{\text{Therms}}\right)\times\text{Heating Efficiency}\left(\%\right)}$$

$$\text{Cooling Leakage Energy}\left(\text{kWh}\right)=\frac{\text{Cooling Load}\left(\text{Ton}\right)\times\left(\frac{12{,}000\text{ Btu}}{\text{Ton Hr.}}\right)\times\text{Full Load Cooling Hours}}{\frac{1000\text{ W.h}}{\text{kWh}}\times\text{Cooling Efficiency}\left(\text{EER}\right)}$$

$$\text{Conductive Energy}\left(\text{Therms}\right)=\frac{\text{U}-\text{Value}\times\text{Area}\left(\text{Ft}^2\right)\times\text{HDD}\left(\text{Day }^{\circ}\text{F}\right)\times 24\left(\frac{\text{Hr.}}{\text{Day}}\right)\times\left(0.60\right)}{65\left(^{\circ}\text{F}\right)\times\text{Fuel Heat Value}\left(\frac{\text{Btu}}{\text{Therms}}\right)\times\text{Heating Efficiency}\left(\%\right)}$$

$$\text{Heating Energy Cost}=\text{Total Heating Energy}\left(\text{Therms}\right)\times\text{Ave Fuel Cost}\left(\frac{\$}{\text{Therms}}\right)$$

$$\text{Cooling Energy Cost}=\text{Total Cooling Energy}\left(\text{kWh}\right)\times\text{Ave Fuel Cost}\left(\frac{\$}{\text{kWh}}\right)$$

Energy calculations are summarized in the table below.

WINDOW REPLACEMENT CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Description:	Existing Windows	Double Pane Low-E Windows	-
Affected Bldg Area (SF)	216,326	216,326	-
Average Ceiling Height (Ft)	10	10	-
Window (SF)	10,000	10,000	-
U-Value (BTU/HR/SF*°F)	0.56	0.35	0.21
Average Leakage Rate (Air Changes per Hr)	0.75	0.5	0.25
Infiltration, CFM	27041	18027	-
Heating System Efficiency (%)	70%	70%	-
Heating Degree Days (HDD)	5,169	5,169	-
Design Day Temp Diff (°F)	60	60	-
Heating Hrs Per Day (Hrs)	12	12	-
Full Load Cooling Hours	1,300	1,300	-
Average Cooling Efficiency, EER	9.0	9.0	-
Gas Cost ($/Therm)	1.23	1.23	-
Electric Cost ($/kWh)	0.133	0.133	-
Gas Heat Value (BTU/Therm)	100,000	100,000	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Heat Load (BTU/Hr)	1,784,690	1,189,793	594,897
Leakage Energy (Therms)	31,629	21,086	10,543
Conductive Energy (Therms)	2,748	1,718	1,031
Total Heating Energy (Therms)	34,377	22,804	11,574
Cooling Load (Ton)	68	45	23
Cooling Demand (kW)	25.6	17.1	8.5
Total Cooling Energy (kWh)	117,177	78,118	39,059
Gas Energy Cost ($)	$42,284	$28,048	$14,235
Electric Energy Cost ($)	$15,584	$10,390	$5,195
Total Savings ($)	-	-	$19,430
Comments:	1. Proposed window U-value Based on ASHRAE 90.1 - 2007		

Estimated cost for replacing all the windows at the Brick Township High School is $750,000. This is based on an estimated cost of $75 per Square Foot of window. This was based on cost estimate of window and contractor installation costs.

Energy Savings Summary:

ECM #11 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$750,000
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$750,000
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$19,430
Total Yearly Savings ($/Yr):	$19,430
Estimated ECM Lifetime (Yr):	15
Simple Payback	38.6
Simple Lifetime ROI	-61.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$291,450
Internal Rate of Return (IRR)	-10%
Net Present Value (NPV)	($518,045.92)

ECM #12: Commercial Kitchen Exhaust Hood Controls

Description:

The kitchen in this facility is equipped with a large 15'x6' commercial kitchen exhaust hood providing exhaust for the cooking equipment. The estimated total kitchen exhaust from the hood is 8,000 CFM powered by an estimated total 2 HP of exhaust fans. The horsepower could not be determined onsite and was estimated based on the hood size and CFM. Currently the facility operates from 6am – 3pm each day. The installation of kitchen exhaust controls would significantly reduce the total kitchen exhaust and its overall energy use. The exhausted air savings are achieved by monitoring the exhaust hoods and exhaust based on the actual use of the kitchen equipment. Temperature sensors and optical lasers monitor the heat and smoke production at each exhaust hood to reduce the exhaust based on the need of the kitchen equipment.

This ECM includes installation of kitchen exhaust controls for the main kitchen exhaust hood and VFD's for the constant volume exhaust fans. The hood would be retrofitted with temperature and laser sensors to monitor the activity of each of all equipment installed below the hoods. The work involves installing a Melink Kitchen Hood Variable Air Volume Controller; variable frequency drive on the kitchen hood exhaust fan; and to turn off all the kitchen hood exhaust systems when the kitchen is closed. When the cooking appliances are turned on, the hood exhaust fan speed will increase based on the hood exhaust temperature. During heavy cooking, the kitchen hood exhaust fan increases to 100% speed until the smoke/vapor is removed. Energy savings are also realized when the kitchen equipment is operating at less than full load due to minimal cooking operations. During these times the fan speed decreases, removing only the necessary amount of air, saving exhaust fan energy.

Energy Calculations Summary:

Detailed calculations for the proposed kitchen hood control system can be found in the **Kitchen Exhaust Calculations Appendix.** It is pertinent to note that the calculation assumes the exhaust fans remain off for approximately 9 hours per day.

The tables below summarize and compare the energy savings with the installed cost of the equipment. The Smart Start program currently offers incentives for premium efficient motors, which is based on installed horsepower. This savings is also included in the savings summary table.

KITCHEN EXHAUST CONTROLS CALCULATION			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Manually Controlled Kitchen Exhaust	MELINK Kitchen Exhaust Controls	-
Fan Energy Usage (kWh)	3,939	1,404	2,535
Heating Energy Usage (Therms)	2,546	1,630	917
Average Gas Cost ($/Therm)	1.23	1.23	-
Electric Cost ($/KWH)	0.133	0.133	-
SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Total Energy Usage (kWh)	3,939	1,404	2,535
Total Energy Usage (Therms)	2,546	1,630	917
Natural Gas Energy Cost ($)	$3,132	$2,005	$1,128
Electric Energy Cost ($)	$524	$187	$337
Total Energy Cost ($)	$3,656	$2,191	$1,465
COMMENTS:	*ECM is based on calculations using spreadsheets privded by MELINK Intelli-hood controls manufacturer.		

Energy Savings Summary:

ECM #12 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$17,993
NJ Smart Start Equipment Incentive ($):	$108
Net Installation Cost ($):	$17,885
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$1,465
Total Yearly Savings ($/Yr):	$1,465
Estimated ECM Lifetime (Yr):	15
Simple Payback	12.2
Simple Lifetime ROI	22.9%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$21,975
Internal Rate of Return (IRR)	3%
Net Present Value (NPV)	($395.93)

ECM #13: DDC Controls

Description:

The HVAC systems within the facility are controlled manually via electronic local thermostats. The units in the system have individual room thermostats that are controlled by building operators.

The typical hours of operation for this facility are Monday through Friday between 17-35 hours per week, dependent on after school activities and holidays. The building is typically closed on weekends.

There is no thermostat adjustments made and set back/set up functions are not employed. Therefore, a DDC system providing the Owner with full control over the HVAC equipment within the building appears to be an energy saving opportunity.

The installation of a Building Automation system with Direct Digital Controls (DDC) wired through an Ethernet backbone and front end controller is the typical solution to gain control over the HVAC systems and to minimize the system energy use.

In the long term, all equipment replacement should include for each unit being replaced a unit DDC controller. The system replacements should include new thermostat controllers for all indoor air-handling systems and the rooftop units, in addition to each piece of equipment being wired back to a front end controller and computer interface. With the communication between the devices and the front end computer interface, the Owner will be able to take advantage of equipment scheduling for occupied and unoccupied periods based on the actual occupancy of the facility. The DDC system will also aid in the response time to service / maintenance issues when the facility is not under normal maintenance supervision, i.e. after-hours and week-ends.

The new DDC system has the potential to provide substantial savings by controlling the HVAC systems as a whole and provide operating schedules and features such as space averaging, night set-back, temperature override control, etc. The U.S. Department of Energy sponsored a study to analyze energy savings achieved through various types of building system controls. The referenced savings is based on the "Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways," document posted for public use April 2005. The study has found that commercial buildings have the potential to achieve significant energy savings through the use of building controls. The average energy savings are as follows based on the referenced report:

- Typical Energy Management and Control System Savings: 5%-15%.

Savings resulting from the implementation of this ECM for energy management controls are estimated to be 10% of the total energy cost for the facility.

The cost of a full DDC system with new field devices, controllers, computer, software, programming, etc. is approximately $3.50 per SF in accordance with recent Contractor pricing for systems of this magnitude. Savings from the implementation of this ECM will be from the reduced energy consumption currently used by the HVAC system by proper control of schedule and temperatures via the DDC system.

Energy Savings Calculations:

10% Savings on Heating Calculations

$$Savings = Heat\ Cons.(Therms) \times 0.90 \times 10\%\ Savings \times Ave\ Gas\ Cost\left(\frac{\$}{Therm}\right)$$

10% Savings on Cooling Calculations**:**

$$Savings = Cool\ Cons.(kWh) \times 10\%\ Savings \times Ave\ Elec\ Cost\left(\frac{\$}{kWh}\right)$$

The calculations are summarized in the table below.

ECM #13 - DDC CONTROLS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Building Total Area (Sq.Ft.)	216,326	216,326	-
Lighting Load (w/Sq.Ft.)	1.5	1.5	-
Plug Load (w/Sq.Ft.)	1	1	-
Annual Electrical Consumption (kWh/yr.)	1,349,325	1,349,325	-
Net Annual Mechanical Electrical Consumption (kWh/yr.)	808,510	808,510	-
Energy Savings	0%	10%	-
Electricity Cost ($/kWh)	$0.133	$0.133	-
Natural Gas Cost ($/Therm)	$1.230	$1.230	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Annual Mechanical Electricity Energy (kWh/yr.)	808,510	727,659	80,851
Annual Heat Energy (Therms)	147,019	132,317	14,702
Annual Electricity Cost ($)	$107,531.83	$96,778.65	$10,753
Annual Natural Gas Energy Cost ($)	$180,833	$162,750	$18,083
Total Annual Savings ($/yr.)	**$288,365**	**$259,528**	**$28,836**

Energy Savings Summary:

ECM #13 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$757,141
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$757,141
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$28,836
Total Yearly Savings ($/Yr):	$28,836
Estimated ECM Lifetime (Yr):	15
Simple Payback	26.3
Simple Lifetime ROI	-42.9%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$432,540
Internal Rate of Return (IRR)	-6%
Net Present Value (NPV)	($412,898.70)

ECM #14: High Efficiency Gas Hot Water Heater

Description:
Domestic hot water for Brick Township High School is provided by running the current boilers to provide hot water for the school. The boilers heat water which is then kept in a large storage tank. This is very inefficient as the entire boiler must be run to provide hot water to the school, even in summer months when the boiler is not required to heat the building. By replacing this system with an estimated capacity domestic hot water heat, overall use of the boiler, and thus energy costs will be lowered. Estimated savings could be higher or lower based on overall boiler usage for building heating.

The boiler efficiency was estimated to allow comparison to a new high efficiency domestic hot water heater. There are two main mechanical rooms currently using boilers for domestic hot water. Each room would require (3) domestic hot water heaters based on the buildings current occupancy and usage. Based on the building size of 216,326 SF it was estimated that (6) – 100 Gallon high efficiency domestic hot water heaters would be adequate for the building's hot water needs. Brick Township Board of Education should retain a professional engineer to finalize the sizing and design of the system.

Energy Savings Calculations:

CONDENSING DOM. HOT WATER HEATER CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Boiler	High Efficiency Hot Water Heater	-
Building Type	Education	Education	-
Building Square-foot	216,326	216,326	-
Domestic Water Usage, kBtu	973,467	973,467	-
DHW Heating Fuel Type	Gas	Gas	-
Heating Efficiency	70%	95%	25%
Total Usage (kBTU)	1,390,667	1,024,702	365,965
Nat Gas Cost ($/Therm)	$1.23	$1.23	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Nat Gas Consumption (Therms)	13,907	10,247	3,660
Energy Cost ($)	$17,105	$12,604	$4,501
COMMENTS:	Savings are based on Energy Information Administration Commercial Building Energy Consumption Survey 2003 Information		

Cost, Rebates and Incentives:

The total installed cost with gas piping is estimated to be **$57,565.**

From the NJ Smart Start® Program appendix, the hot water heater installation falls under the category "Gas Water Heating" and warrants an incentive as follows:

Smart Start ® Incentive: $2/MBH × Unit Capacity, MBH
(Water Heaters > 50 Gallons, up to 300 MBH)

900 MBH x $2/MBH = **$1800**

Energy Savings Summary:

ECM #14 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$57,565
NJ Smart Start Equipment Incentive ($):	$1,800
Net Installation Cost ($):	$55,765
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$4,501
Total Yearly Savings ($/Yr):	$4,501
Estimated ECM Lifetime (Yr):	15
Simple Payback	12.4
Simple Lifetime ROI	21.1%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$67,515
Internal Rate of Return (IRR)	2%
Net Present Value (NPV)	($2,032.35)

ECM #15: Vending Miser Controls

Description:

Brick Township High School currently utilizes vending machines in select areas within the building. Vending machines are common within cafeteria's and faculty rooms which can be in use for a limited time during the day. The installation of the Vending Miser system will help reduce the operating hours of vending machines.

Cold beverage machines regularly operate inefficiently trying to maintain a constant cool temperature within the machine and snack machines with no cooling usually have lights that operate 24/7. The VendingMiser® system incorporates innovative energy-saving technology into a small plug-and-play device that in conjunction with a passive infrared sensor regulate the operation of the cold beverage and snack machines based on occupancy and room temperature. This ECM approximates the installation of three (3) of these control systems, one (1) for the cold beverage machine, and two (2) for the snack machines

Energy Savings Calculations:

See **Vending Miser Appendix** for calculation methods and analysis.

Energy Savings Summary:

ECM #15 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$337
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$337
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$415
Total Yearly Savings ($/Yr):	$415
Estimated ECM Lifetime (Yr):	15
Simple Payback	0.8
Simple Lifetime ROI	1747.2%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$6,225
Internal Rate of Return (IRR)	123%
Net Present Value (NPV)	$4,617.24

ECM #16: Geothermal Heat Pump System Installation

Description:

The existing heating system of the building consists of central boilers that provide hot water to perimeter classroom unit ventilators and heating and ventilation units. The cooling system of the building consists of a packaged D/X cooling and natural gas fired rooftop units, split system D/X cooling only units and window A/C units. The existing heating system for the whole building utilizes natural gas as the fuel source.

A geothermal heat pump system utilizes the ground as a heat sink to extract and reject heat to depending on the season. Due to the large thermal mass provided by the ground, the HVAC equipment is able to take advantage of cooler temperatures is the summer and warmer temperatures in the winter compared to the ambient air. The benefits include substantial energy efficiency increase with respect to air source systems. In addition, no electrical resistance heat is required in the heating season also reducing electric usage. A geothermal system sized properly requires no additional heat production equipment (such as a boiler) or heat rejection equipment (such as a cooling tower). All loads are handled by the heat pumps and the geothermal water loop. Due to the inefficiency of the boiler and poor operational characteristics of the air to air heat pumps, a geothermal system energy costs become very appealing.

This ECM includes the installation of ground source heat pumps installed above the ceilings of each classroom, or mounted upright in a closet style configuration. This is in place of the existing unit ventilators in the classrooms and offices. Outside air would be provided by a dedicated central outside air heat pump distributed by ductwork above the corridor to each occupied zone. This system would provide ventilation air to replace the outside air openings currently ducted to each unit ventilator. The air to air heat pumps would be replaced with packaged rooftop ground source heat pumps. The proposed outside air unit would include an energy recovery wheel for additional savings on ventilation air. This ECM also includes installation of new ground loop water pumps with VFD drives. The pumping system is included to pump transfer fluid from the building to the well field and back. The geothermal system would require (not limited to) the following major components:

1. 1,050-Ton (Heating Dominant) bore field located South East of the building. (350 bores, 450 ft deep each). Bore field sizing is based on 150 linear feet of bore per ton of cooling. A complete geotechnical analysis will have to be performed in order to confirm the actual soil thermal conductivity at the site.
2. (6) Loop condenser water pumps.
3. Condenser water piping distribution system from the well field to the roof top units and indoor heat pumps.
4. Installation of high-efficiency (16 EER) geothermal rooftop units to provide heated and cooled ventilation air and (18 EER) geothermal indoor heat pumps to replace the classroom unit ventilators.
5. Removal all existing AC units, air handlers and unit ventilators

This ECM is based on Climate Master Tranquility Series water source heat pumps model TRE for the rooftop units, and model TS or TV for the horizontal / vertical units or equal. **Note:** Sizing indicated within the calculation of this ECM is based on a one for one replacement of the existing equipment. Owner should have a Professional Engineer verify heating and cooling loads prior to moving forward with this ECM.

Energy Savings Calculations:

The energy savings calculations are based on the energy analysis performed on the energy modeling software by Trane (Trace 700 ver. 6.2.4). The energy consumption of the baseline is compared to the proposed model to determine energy savings for each utility. The savings are applied to the average energy costs based on the facilities actual usage. Note: Heating and cooling is provided for the entire building the geothermal system model.

ECM #16 GEOTHERMAL SYSTEM CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Energy Consumption	Proposed Energy Consumption	
Elec Usage (KWH)	1,349,325	1,814,972	-465,647
Natural Gas Usage (Therms)*	163,354	5,500	157,854
Electric Cost ($/KWH)	$0.133	$0.133	
Natural Gas Cost ($/Therm)	$1.23	$1.23	
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Electric Energy Cost ($)	$178,979	$240,743	-$61,765
Natural Gas Energy Cost ($)	$200,561	$6,753	$193,808
Total Energy Cost ($)	$379,539	$247,496	$132,043
COMMENTS:	This ECM is based on energy models performed on energy analysis software by Trane (Trace 700).		
	*Natural gas usage for existing and proposed systems includes gas fired domestic hot water heating equipment		

Energy Savings Summary:

ECM #16 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$5,001,512
NJ Smart Start Equipment Incentive ($):	$472,500
Net Installation Cost ($):	$4,529,012
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$132,043
Total Yearly Savings ($/Yr):	$132,043
Estimated ECM Lifetime (Yr):	30
Simple Payback	34.3
Simple Lifetime ROI	-12.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$3,961,290
Internal Rate of Return (IRR)	-1%
Net Present Value (NPV)	($1,940,910.92)

***Note:** ECM #16 – Geothermal System Installation is an alternate ECM. Implementation of ECM #16 would eliminate the potential for ECM #s – 3, 4, 5, 6, 7 & 10.

ECM #17: Water Conservation

Description:

The facility utilizes standard plumbing fixtures. The typical water closet and urinal water consumption only meet the minimum federally required standard for water efficiency. New fixtures are available that use less water than today's requirements and can add up to significant water reduction over a long period.

This ECM includes the replacement of the existing sink faucets, water closets and urinals within the bathrooms the facility. The estimated usage of the plumbing fixtures is based on the total population of the facility. The number of plumbing fixtures to be replaced is based on site survey of the facilities.

The proposed retrofit includes installation of auto flow sink faucets, low flow aerators, low flow flushometer style water closets that utilize 1.28 gallons per flush and ultra-low flushometer style urinals that utilize 1/8 gallons per flush. For the basis of this calculation the LEED rating system was used to estimate the occupancy usage for students within the school. When water consumption information was not available, the GPF values were estimated for the existing fixtures.

Energy Savings Calculations:

Urinals and Toilets:

$$\text{Water Consumption} = \text{Occupancy}\left(\frac{\text{Days}}{\text{Yr}}\right) \times \text{Use}\left(\frac{\text{Flush}}{\text{Person per Day}}\right) \times \text{Fixture}\left(\frac{\text{Gal}}{\text{Flush}}\right)$$

Faucets:

$$\text{Water Consumption} = \text{Occupancy}\left(\frac{\text{Days}}{\text{Yr}}\right) \times \text{Use}\left(\frac{\text{Use}}{\text{Person per Day}}\right) \times \text{Use Time}\left(\frac{\text{Sec}}{\text{Use}}\right) \times \text{Fixture}\left(\frac{\text{Gal}}{\text{Min}}\right)$$

$$\text{Water Cost} = \frac{\text{Water Consumption (Gallons)} \times \text{Ave Cost}\left(\frac{\$}{1000\ \text{Gal}}\right)}{1000(\text{Gal})}$$

$$\text{Gas Cost (Therms)} = \text{Faucet Water Consumption (Gallons)} \times \frac{8.34\ \text{BTU}}{\text{Gal}} \times \frac{\text{Therm}}{100{,}000\ \text{BTU}}$$

WATER CONSERVATION CALCULATIONS			
ECM INPUTS	**EXISTING**	**PROPOSED**	**SAVINGS**
ECM INPUTS	Existing Fixtures	Low Flow / Auto Flow Fixtures	-
Total Number of Students	1,852	1,852	-
% Male to Female	50%	50%	-
Estimated % Floor Area Served by Older Bathrooms	100%	100%	-
Occupied Days Per Year	252	252	-
Lavatory Uses per Day per Person	3	3	-
Sink flow time per use, sec	15	12	-
Sink Aerator Flow, GPM	1.5	0.5	-
WC Uses per Day per Person	2.0	2.0	-
Urinal Uses per Day per Person	1.0	1.0	-
Total Urinal Flushes Per Day	926	926	-
Total WC Flushes Per Day	1,852	1,852	-
Urinal Gallons Per Flush (GPF)	1.0	0.125	0.875
WC Gallons Per Flush (GPF)	1.6	1.28	0.32
**** Water Cost ($/1000 Gal)**	$8.00	$8.00	-
Gas Cost ($/Therm)	$1.24	$1.24	-
ENERGY SAVINGS CALCULATIONS			
ECM RESULTS	**EXISTING**	**PROPOSED**	**SAVINGS**
Water Consumption, Urinal and WC (Gal)	980,078	626,550	353,528
Water Consumption, Faucets (Gal)	525,042	140,011	385,031
Total Water Consumption, (Gal)	1,505,120	766,561	738,559
Water Cost ($)	$12,041	$6,132	$5,908
Gas Consumption (Therms)	2,189	584	1,606
Gas Cost ($/Year)	$2,715	$724	$1,991
COMMENTS:	*Savings are based on LEED Reference Guide for Green Building Design and Construction - 2009 Edition for WC and Urinal water usage. ** Cost of Water estimated.		

The cost for installation and materials of 34 water closets, 21 low flow urinals and 36 new auto flow sink faucets throughout the facility is estimated to be $86,196. There are no Smart Start rebates for installation of low flow plumbing fixtures.

Energy Savings Summary:

ECM #17 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$86,196
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$86,196
Maintenance Savings ($/Yr):	$0
Energy Savings ($/Yr):	$7,899
Total Yearly Savings ($/Yr):	$7,899
Estimated ECM Lifetime (Yr):	15
Simple Payback	10.9
Simple Lifetime ROI	37.5%
Simple Lifetime Maintenance Savings	$0
Simple Lifetime Savings	$118,485
Internal Rate of Return (IRR)	4%
Net Present Value (NPV)	$8,101.75

REM #1: Rooftop Solar Array

Description:

Brick Township High School has approximately 37,479 square-foot of available roof space that can accommodate a 290 kilowatt solar array, assuming the existing roof structure is capable of supporting an array.

The array will produce approximately 438,574 kilowatt-hours annually that will reduce the overall electric usage of the facility by 33%.

Energy Savings Calculations:

See **LGEA Solar Financials Appendix F** for detailed financial summary and proposed solar layout areas.

Energy Savings Summary:

REM #1 - ENERGY SAVINGS SUMMARY	
Installation Cost ($):	$2,122,797
NJ Smart Start Equipment Incentive ($):	$0
Net Installation Cost ($):	$2,122,797
Maintenance Savings ($/Yr):	$169,116
Energy Savings ($/Yr):	$58,330
Total Yearly Savings ($/Yr):	$227,446
Estimated ECM Lifetime (Yr):	15
Simple Payback	9.3
Simple Lifetime ROI	60.7%
Simple Lifetime Maintenance Savings	$2,536,740
Simple Lifetime Savings	$3,411,690
Internal Rate of Return (IRR)	7%
Net Present Value (NPV)	$592,438.58

V. ADDITIONAL RECOMMENDATIONS

The following recommendations include no cost/low cost measures, Operation & Maintenance (O&M) items, and water conservation measures with attractive paybacks. These measures are not eligible for the Smart Start Buildings incentives from the office of Clean Energy but save energy none the less.

A. Chemically clean the condenser and evaporator coils periodically to optimize efficiency. Poorly maintained heat transfer surfaces can reduce efficiency 5-10%.

B. Maintain all weather stripping on windows and doors.

C. Clean all light fixtures to maximize light output.

D. Provide more frequent air filter changes to decrease overall system power usage and maintain better IAQ.

E. Turn off computers when not in use. Ensure computers are not running in screen saver mode which saves the monitor screen not energy.

F. Ensure outside air dampers are functioning properly and only open during occupied mode.

APPENDIX A

ECM COST & SAVINGS BREAKDOWN

CONCORD ENGINEERING GROUP

Brick Township Board of Education - Brick Township High School

ECM NO.	DESCRIPTION	INSTALLATION COST				YEARLY SAVINGS			ECM LIFETIME	LIFETIME ENERGY SAVINGS	LIFETIME MAINTENANCE SAVINGS	LIFETIME ROI	SIMPLE PAYBACK	INTERNAL RATE OF RETURN (IRR)	NET PRESENT VALUE (NPV)
		MATERIAL	LABOR	REBATES, INCENTIVES	NET INSTALLATION COST	ENERGY	MAINT. / SREC	TOTAL		(Yearly Saving * ECM Lifetime)	(Yearly Maint Svaing * ECM Lifetime)	(Lifetime Savings - Net Cost) / (Net Cost)	(Net cost / Yearly Savings)	$\sum_{n=0}^{N} \frac{C_n}{(1+IRR)^n}$	$\sum_{n=0}^{N} \frac{C_n}{(1+DR)^n}$
		($)	($)	($)	($)	($/Yr)	($/Yr)	($/Yr)	(Yr)	($)	($)	(%)	(Yr)	($)	($)
ECM #1	Lighting Upgrade	$23,040	$0	$4,199	$18,841	$2,516	$45	$2,561	15	$38,415	$675	103.9%	7.4	10.59%	$11,732.05
ECM #2	Lighting Controls	$19,700	$0	$3,050	$16,650	$2,516	$0	$2,516	15	$37,740	$0	126.7%	6.6	12.54%	$13,385.84
ECM #3	Condensing Unit Replacement	$48,005	$0	$1,932	$46,073	$1,459	$0	$1,459	15	$21,885	$0	-52.5%	31.6	-8.13%	($28,655.55)
ECM #4	Rooftop Unit Replacement	$51,197	$0	$2,500	$48,697	$2,745	$0	$2,745	15	$41,175	$0	-15.4%	17.7	-2.03%	($15,927.37)
ECM #5	Condensing Boiler Installation	$309,000	$509,850	$18,000	$800,850	$44,395	$0	$44,395	30	$1,331,850	$0	66.3%	18.0	3.66%	$69,311.59
ECM #6	NEMA Premium Motors	$6,871	$3,933	$550	$10,254	$863	$0	$863	15	$12,945	$0	26.2%	11.9	3.07%	$48.44
ECM #7	Demand Controlled Ventilation	$18,000	$44,000	$0	$62,000	$4,465	$0	$4,465	15	$66,975	$0	8.0%	13.9	0.98%	($8,697.12)
ECM #8	NOT USED	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ECM #9	Valve and Pipe Insulation	$1,700	$5,850	$0	$7,550	$843	$0	$843	15	$12,645	$0	67.5%	9.0	7.27%	$2,513.68
ECM #10	HW VFD Pumping	$117,000	$0	$0	$117,000	$9,903	$0	$9,903	15	$148,545	$0	27.0%	11.8	3.14%	$1,221.37
ECM #11	Window Replacement	$750,000	$0	$0	$750,000	$19,430	$0	$19,430	15	$291,450	$0	-61.1%	38.6	-10.01%	($518,045.92)
ECM #12	Kitchen Hood Controls	$17,993	$0	$108	$17,885	$1,465	$0	$1,465	15	$21,975	$0	22.9%	12.2	2.69%	($395.93)
ECM #13	DDC Controls Upgrade	$757,141	$0	$0	$757,141	$28,836	$0	$28,836	15	$432,540	$0	-42.9%	26.3	-6.30%	($412,898.70)
ECM #14	Domestic HWH Replacement	$57,565	$0	$1,800	$55,765	$4,501	$0	$4,501	15	$67,515	$0	21.1%	12.4	2.49%	($2,032.35)
ECM #15	Vending Machine Controls	$337	$0	$0	$337	$415	$0	$415	15	$6,225	$0	1747.2%	0.8	123.14%	$4,617.24
ECM #16	Geothermal HP System	$2,282,634	$2,718,878	$472,500	$4,529,012	$132,043	$0	$132,043	30	$3,961,290	$0	-12.5%	34.3	-0.84%	($1,940,910.92)
ECM #17	Water Conservation	$86,196	$0	$0	$86,196	$7,899	$0	$7,899	15	$118,485	$0	37.5%	10.9	4.27%	$8,101.75
REM RENEWABLE ENERGY AND FINANCIAL COSTS AND SAVINGS SUMMARY															
REM #1	Solary Array	$2,122,797	$0	$0	$2,122,797	$58,330	$169,116	$227,446	15	$3,411,690	$2,536,740	60.7%	9.3	7.00%	$592,438.58

Notes: 1) The variable Cn in the formulas for Internal Rate of Return and Net Present Value stands for the cash flow during each period.
2) The variable DR in the NPV equation stands for Discount Rate
3) For NPV and IRR calculations: From n=0 to N periods where N is the *lifetime of ECM* and Cn is the *cash flow during each period* .

APPENDIX B

Concord Engineering Group, Inc.

520 BURNT MILL ROAD
VOORHEES, NEW JERSEY 08043
PHONE: (856) 427-0200
FAX: (856) 427-6508

SmartStart Building Incentives

The NJ SmartStart Buildings Program offers financial incentives on a wide variety of building system equipment. The incentives were developed to help offset the initial cost of energy-efficient equipment. The following tables show the current available incentives as of February, 2010:

Electric Chillers

Water-Cooled Chillers	$12 - $170 per ton
Air-Cooled Chillers	$8 - $52 per ton

Energy Efficiency must comply with ASHRAE 90.1-2004

Gas Cooling

Gas Absorption Chillers	$185 - $400 per ton
Gas Engine-Driven Chillers	Calculated through custom measure path)

Desiccant Systems

$1.00 per cfm – gas or electric

Electric Unitary HVAC

Unitary AC and Split Systems	$73 - $93 per ton
Air-to-Air Heat Pumps	$73 - $92 per ton
Water-Source Heat Pumps	$81 per ton
Packaged Terminal AC & HP	$65 per ton
Central DX AC Systems	$40- $72 per ton
Dual Enthalpy Economizer Controls	$250
Occupancy Controlled Thermostat (Hospitality & Institutional Facility)	$75 per thermostat

Energy Efficiency must comply with ASHRAE 90.1-2004

Ground Source Heat Pumps

Closed Loop & Open Loop	$450 per ton, EER ≥ 16 $600 per ton, EER ≥ 18 $750 per ton, EER ≥ 20

Energy Efficiency must comply with ASHRAE 90.1-2004

Gas Heating

Gas Fired Boilers < 300 MBH	$300 per unit
Gas Fired Boilers ≥ 300 - 1500 MBH	$1.75 per MBH
Gas Fired Boilers ≥1500 - ≤ 4000 MBH	$1.00 per MBH
Gas Fired Boilers > 4000 MBH	(Calculated through Custom Measure Path)
Gas Furnaces	$300 - $400 per unit, AFUE ≥ 92%

Variable Frequency Drives

Variable Air Volume	$65 - $155 per hp
Chilled-Water Pumps	$60 per hp
Compressors	$5,250 to $12,500 per drive

Natural Gas Water Heating

Gas Water Heaters ≤ 50 gallons	$50 per unit
Gas-Fired Water Heaters > 50 gallons	$1.00 - $2.00 per MBH
Gas-Fired Booster Water Heaters	$17 - $35 per MBH
Gas Fired Tankless Water Heaters	$300 per unit

Prescriptive Lighting

Retro fit of T12 to T-5 or T-8 Lamps w/Electronic Ballast in Existing Facilities	$10 per fixture (1-4 lamps)
Replacement of T12 with new T-5 or T-8 Lamps w/Electronic Ballast in Existing Facilities	$25 per fixture (1-2 lamps) $30 per fixture (3-4 lamps)
Replacement of incandescent with screw-in PAR 38 or PAR 30 (CFL) bulb	$7 per bulb
T-8 reduced Wattage (28w/25w 4', 1-4 lamps) Lamp & ballast replacement	$10 per fixture
Hard-Wired Compact Fluorescent	$25 - $30 per fixture
Metal Halide w/Pulse Start	$25 per fixture
LED Exit Signs	$10 - $20 per fixture
T-5 and T-8 High Bay Fixtures	$16 - $284 per fixture
HID ≥ 100w Retrofit with induction lamp, power coupler and generator (must be 30% less watts/fixture than HID system)	$50 per fixture
HID ≥ 100w Replacement with new HID ≥ 100w	$70 per fixture
LED Refrigerator/Freezer case lighting replacement of fluorescent in medium and low temperature display case	$42 per 5 foot $65 per 6 foot

Lighting Controls – Occupancy Sensors

Wall Mounted	$20 per control
Remote Mounted	$35 per control
Daylight Dimmers	$25 per fixture
Occupancy Controlled hi-low Fluorescent Controls	$25 per fixture controlled

Lighting Controls – HID or Fluorescent Hi-Bay Controls

Occupancy hi-low	$75 per fixture controlled
Daylight Dimming	$75 per fixture controlled
Daylight Dimming - office	$50 per fixture controlled

Premium Motors

Three-Phase Motors	$45 - $700 per motor
Fractional HP Motors Electronic Communicated Motors (replacing shaded pole motors in refrigerator/freezer cases)	$40 per electronic communicated motor

Other Equipment Incentives

Performance Lighting	$1.00 per watt per SF below program incentive threshold, currently 5% more energy efficient than ASHRAE 90.1-2004 for New Construction and Complete Renovation
Custom Electric and Gas Equipment Incentives	not prescriptive
Custom Measures	$0.16 KWh and $1.60/Therm of 1st year savings, or a buy down to a 1 year payback on estimated savings. Minimum required savings of 75,000 KWh or 1,500 Therms and a IRR of at least 10%.
Multi Measures Bonus	15%

APPENDIX C

OMB No. 2060-0347

STATEMENT OF ENERGY PERFORMANCE
Brick Township High School

Building ID: 2731356
For 12-month Period Ending: December 31, 2010[1]
Date SEP becomes ineligible: N/A
Date SEP Generated: May 31, 2011

Facility
Brick Township High School
346 Chambers Bridge Road
Brick, NJ 08723

Facility Owner
Brick Township Public School District
101 Hendrickson Avenue
Brick, NJ 08724

Primary Contact for this Facility
James Edwards
101 Hendrickson Avenue
Brick, NJ 08724

Year Built: 1958
Gross Floor Area (ft²): 216,326

Energy Performance Rating[2] (1-100) 46

Site Energy Use Summary[3]

Electricity - Grid Purchase(kBtu)	4,711,478
Natural Gas (kBtu)[4]	16,335,425
Total Energy (kBtu)	21,046,903

Energy Intensity[5]

Site (kBtu/ft²/yr)	97
Source (kBtu/ft²/yr)	152

Emissions (based on site energy use)

Greenhouse Gas Emissions ($MtCO_2e$/year)	1,536

Electric Distribution Utility
Jersey Central Power & Light Co [FirstEnergy Corp]

National Average Comparison

National Average Site EUI	94
National Average Source EUI	147
% Difference from National Average Source EUI	3%
Building Type	K-12 School

Stamp of Certifying Professional

Based on the conditions observed at the time of my visit to this building, I certify that the information contained within this statement is accurate.

Meets Industry Standards[6] **for Indoor Environmental Conditions:**

Ventilation for Acceptable Indoor Air Quality	**N/A**
Acceptable Thermal Environmental Conditions	**N/A**
Adequate Illumination	**N/A**

Certifying Professional
Michael Fischette
520 South Burnt Mill Road
Voorhees, NJ 08043

Notes:
1. Application for the ENERGY STAR must be submitted to EPA within 4 months of the Period Ending date. Award of the ENERGY STAR is not final until approval is received from EPA.
2. The EPA Energy Performance Rating is based on total source energy. A rating of 75 is the minimum to be eligible for the ENERGY STAR.
3. Values represent energy consumption, annualized to a 12-month period.
4. Values represent energy intensity, annualized to a 12-month period.
5. Based on Meeting ASHRAE Standard 62 for ventilation for acceptable indoor air quality, ASHRAE Standard 55 for thermal comfort, and IESNA Lighting Handbook for lighting quality.

ENERGY STAR® Data Checklist for Commercial Buildings

In order for a building to qualify for the ENERGY STAR, a Professional Engineer (PE) or a Registered Architect (RA) must validate the accuracy of the data underlying the building's energy performance rating. This checklist is designed to provide an at-a-glance summary of a property's physical and operating characteristics, as well as its total energy consumption, to assist the PE or RA in double-checking the information that the building owner or operator has entered into Portfolio Manager.

Please complete and sign this checklist and include it with the stamped, signed Statement of Energy Performance.
NOTE: You must check each box to indicate that each value is correct, OR include a note.

CRITERION	VALUE AS ENTERED IN PORTFOLIO MANAGER	VERIFICATION QUESTIONS	NOTES	☑
Building Name	Brick Township High School	Is this the official building name to be displayed in the ENERGY STAR Registry of Labeled Buildings?		☐
Type	K-12 School	Is this an accurate description of the space in question?		☐
Location	346 Chambers Bridge Road, Brick, NJ 08723	Is this address accurate and complete? Correct weather normalization requires an accurate zip code.		☐
Single Structure	Single Facility	Does this SEP represent a single structure? SEPs cannot be submitted for multiple-building campuses (with the exception of acute care or children's hospitals) nor can they be submitted as representing only a portion of a building		☐
Brick Twp BOE - Brick Township High School (K-12 School)				
CRITERION	**VALUE AS ENTERED IN PORTFOLIO MANAGER**	**VERIFICATION QUESTIONS**	**NOTES**	☑
Gross Floor Area	216,326 Sq. Ft.	Does this square footage include all supporting functions such as kitchens and break rooms used by staff, storage areas, administrative areas, elevators, stairwells, atria, vent shafts, etc. Also note that existing atriums should only include the base floor area that it occupies. Interstitial (plenum) space between floors should not be included in the total. Finally gross floor area is not the same as leasable space. Leasable space is a subset of gross floor area.		☐
Open Weekends?	No	Is this building normally open at all on the weekends? This includes activities beyond the work conducted by maintenance, cleaning, and security personnel. Weekend activity could include any time when the space is used for classes, performances or other school or community activities. If the building is open on the weekend as part of the standard schedule during one or more seasons, the building should select ?yes? for open weekends. The ?yes? response should apply whether the building is open for one or both of the weekend days.		☐
Number of PCs	379 (Default)	Is this the number of personal computers in the K12 School?		☐
Number of walk-in refrigeration/freezer units	2	Is this the total number of commercial walk-in type freezers and coolers? These units are typically found in storage and receiving areas.		☐
Presence of cooking facilities	Yes	Does this school have a dedicated space in which food is prepared and served to students? If the school has space in which food for students is only kept warm and/or served to students, or has only a galley that is used by teachers and staff then the answer is "no".		☐
Percent Cooled	80 %	Is this the percentage of the total floor space within the facility that is served by mechanical cooling equipment?		☐
Percent Heated	100 %	Is this the percentage of the total floor space within the facility that is served by mechanical heating equipment?		☐
Months	10(Optional)	Is this school in operation for at least 8 months of the year?		☐

High School?	Yes	Is this building a high school (teaching grades 10, 11, and/or 12)? If the building teaches to high school students at all, the user should check 'yes' to 'high school'. For example, if the school teaches to grades K-12 (elementary/middle and high school), the user should check 'yes' to 'high school'.		☐

ENERGY STAR® Data Checklist for Commercial Buildings

Energy Consumption

Power Generation Plant or Distribution Utility: Jersey Central Power & Light Co [FirstEnergy Corp]

Fuel Type: Electricity

Meter: Electric (kWh (thousand Watt-hours))
Space(s): Entire Facility
Generation Method: Grid Purchase

Start Date	End Date	Energy Use (kWh (thousand Watt-hours))
12/01/2010	12/31/2010	108,624.00
11/01/2010	11/30/2010	109,576.00
10/01/2010	10/31/2010	110,510.00
09/01/2010	09/30/2010	122,052.00
08/01/2010	08/31/2010	124,873.00
07/01/2010	07/31/2010	139,352.00
06/01/2010	06/30/2010	135,995.00
05/01/2010	05/31/2010	113,529.00
04/01/2010	04/30/2010	104,094.00
03/01/2010	03/31/2010	118,853.00
02/01/2010	02/28/2010	76,119.00
Electric Consumption (kWh (thousand Watt-hours))		**1,263,577.00**
Electric Consumption (kBtu (thousand Btu))		**4,311,324.72**
Total Electricity (Grid Purchase) Consumption (kBtu (thousand Btu))		**4,311,324.72**
Is this the total Electricity (Grid Purchase) consumption at this building including all Electricity meters?		☐

Fuel Type: Natural Gas

Meter: Gas (therms)
Space(s): Entire Facility

Start Date	End Date	Energy Use (therms)
12/01/2010	12/31/2010	24,734.80
11/01/2010	11/30/2010	11,970.50
10/01/2010	10/31/2010	2,314.13
09/01/2010	09/30/2010	766.11
08/01/2010	08/31/2010	352.27
07/01/2010	07/31/2010	1,091.50
06/01/2010	06/30/2010	3,524.58
05/01/2010	05/31/2010	9,780.69
04/01/2010	04/30/2010	13,525.69
03/01/2010	03/31/2010	31,714.80
02/01/2010	02/28/2010	26,080.12

01/01/2010	01/31/2010	37,499.06
Gas Consumption (therms)		**163,354.25**
Gas Consumption (kBtu (thousand Btu))		**16,335,425.00**
Total Natural Gas Consumption (kBtu (thousand Btu))		**16,335,425.00**
Is this the total Natural Gas consumption at this building including all Natural Gas meters?		☐

Additional Fuels	
Do the fuel consumption totals shown above represent the total energy use of this building? Please confirm there are no additional fuels (district energy, generator fuel oil) used in this facility.	☐

On-Site Solar and Wind Energy	
Do the fuel consumption totals shown above include all on-site solar and/or wind power located at your facility? Please confirm that no on-site solar or wind installations have been omitted from this list. All on-site systems must be reported.	☐

Certifying Professional

(When applying for the ENERGY STAR, the Certifying Professional must be the same PE or RA that signed and stamped the SEP.)

Name: _____ Date: _____

Signature: _____

Signature is required when applying for the ENERGY STAR.

FOR YOUR RECORDS ONLY. DO NOT SUBMIT TO EPA.

Please keep this Facility Summary for your own records; do not submit it to EPA. Only the Statement of Energy Performance (SEP), Data Checklist and Letter of Agreement need to be submitted to EPA when applying for the ENERGY STAR.

Facility
Brick Township High School
346 Chambers Bridge Road
Brick, NJ 08723

Facility Owner
Brick Township Public School District
101 Hendrickson Avenue
Brick, NJ 08724

Primary Contact for this Facility
James Edwards
101 Hendrickson Avenue
Brick, NJ 08724

General Information

Brick Township High School	
Gross Floor Area Excluding Parking: (ft^2)	216,326
Year Built	1958
For 12-month Evaluation Period Ending Date:	December 31, 2010

Facility Space Use Summary

Brick Twp BOE - Brick Township High School	
Space Type	K-12 School
Gross Floor Area(ft^2)	216,326
Open Weekends?	No
Number of PCs[d]	379
Number of walk-in refrigeration/freezer units	2
Presence of cooking facilities	Yes
Percent Cooled	80
Percent Heated	100
Months[o]	10
High School?	Yes
School District[o]	Brick

Energy Performance Comparison

	Evaluation Periods		Comparisons		
Performance Metrics	**Current** (Ending Date 12/31/2010)	**Baseline** (Ending Date 12/31/2010)	**Rating of 75**	**Target**	**National Average**
Energy Performance Rating	46	46	75	N/A	50
Energy Intensity					
Site (kBtu/ft^2)	97	97	74	N/A	94
Source (kBtu/ft^2)	152	152	115	N/A	147
Energy Cost					
$/year	N/A	N/A	N/A	N/A	N/A
$/$ft^2$/year	N/A	N/A	N/A	N/A	N/A
Greenhouse Gas Emissions					
$MtCO_2e$/year	1,536	1,536	1,166	N/A	1,491
$kgCO_2e/ft^2$/year	7	7	5	N/A	7

More than 50% of your building is defined as K-12 School. Please note that your rating accounts for all of the spaces listed. The National Average column presents energy performance data your building would have if your building had an average rating of 50.

Notes:
o - This attribute is optional.
d - A default value has been supplied by Portfolio Manager.

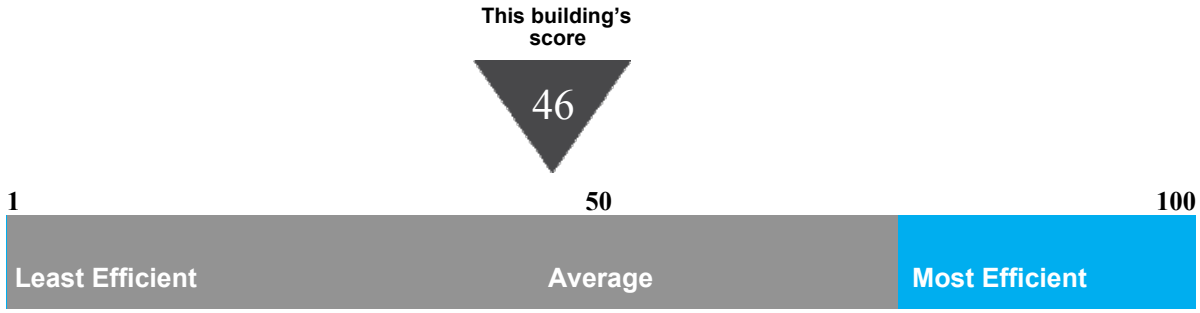
Statement of Energy Performance

2010

Brick Township High School
346 Chambers Bridge Road
Brick, NJ 08723

Portfolio Manager Building ID: 2731356

The energy use of this building has been measured and compared to other similar buildings using the Environmental Protection Agency's (EPA's) Energy Performance Scale of 1–100, with 1 being the least energy efficient and 100 the most energy efficient. For more information, visit energystar.gov/benchmark.



This building uses 152 kBtu per square foot per year.*

*Based on source energy intensity for the 12 month period ending December 2010

Buildings with a score of 75 or higher may qualify for EPA's ENERGY STAR.

I certify that the information contained within this statement is accurate and in accordance with U.S. Environmental Protection Agency's measurement standards, found at energystar.gov

Date of certification

EPA United States Environmental Protection Agency

Date Generated: 05/31/2011

APPENDIX D

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Rooftop / AC Units

Tag	CU-1	CU-2	CU-3
Unit Type	Condensing Unit	Condensing Unit	Condensing Unit
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served	Faculty room	East Gym Office	East Gym Office
Manufacturer	Carrier	Airedale	Airedale
Model #	38QR018C331	SCC12DAX0A0AAA	SHC240FA0A0AA0A
Serial #	1300X33758	1-02-L-9967-46	1-02-L-9907-46
Cooling Type	D/X, R-22	D/X, R-22	D/X, R-22
Cooling Capacity (Tons)	1-1/2	1	2
Cooling Efficiency (SEER/EER)	9.0 (est)	9.0 (est)	9.0 (est)
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	11	9	9
ASHRAE Service Life	15	15	15
Remaining Life	4	6	6
Comments	Unit is in fair condition	Unit is in fair condition	Unit is in fair condition

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Rooftop / AC Units

Tag	CU-4	CU-5	RTU-1
Unit Type	Condensing Unit	Condensing Unit	Packaged Rooftop Unit
Qty	1	1	1
Location	Roof	2nd Floor Roof	Roof
Area Served	East Gym Office	Room 402	Weight Room
Manufacturer	Goodman	Carrier	Aaon
Model #	HDC18-1AB	38HDC036321	RK-20-2-E0-31M
Serial #	102507533	1B03Y	200210-AKGN41947
Cooling Type	D/X, R-22	D/X, R-22	D/X, R-22
Cooling Capacity (Tons)	1-1/2	3	20
Cooling Efficiency (SEER/EER)	9.0 (est)	9.0 (est)	9.0 (est)
Heating Type	N/A	N/A	Gas
Heating Input (MBH)	N/A	N/A	270
Efficiency	N/A	N/A	81%
Fuel	N/A	N/A	Natural Gas
Approx Age	11	9	9
ASHRAE Service Life	15	15	15
Remaining Life	4	6	6
Comments	Unit is in fair condition	Unit is in fair condition	Unit is in fair condition

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Rooftop / AC Units

Tag	CU-6, 7	RTU-2	CU-8
Unit Type	Condensing Unit	Packaged Rooftop Unit	Condensing Unit
Qty	1	1	1
Location	Roof	Roof	Roof
Area Served	Walk-in refrigerator	West Faculty Dining	Main Office
Manufacturer	Goodman	Trane	Bryant
Model #	TEHA 025 L6-HT3A	TSC048A3R0A1YD	593CJ060-D
Serial #	072206586 & 072206587	31102881L	1004E16618
Cooling Type	D/X, R-404A	D/X, R-22	D/X, R-22
Cooling Capacity (Tons)	2	4	5
Cooling Efficiency (EER)	-	10.0	9.2
Heating Type	N/A	N/A	N/A
Heating Input (MBH)	N/A	N/A	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	5	5	7
ASHRAE Service Life	15	15	15
Remaining Life	10	10	8
Comments	Units are in good condition	Unit is in good condition	Unit is in good condition

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Rooftop / AC Units

Tag	CU-9	RTU-3, 4	RTU-5
Unit Type	Condensing Unit	Packaged VAV Rooftop Unit	Packaged Rooftop Unit
Qty	1	2	1
Location	Roof	Roof	Roof
Area Served	Guidance	Auditorium	Classroom 117
Manufacturer	Bryant	Carrier	Arcoarie
Model #	593CJ060-C	50DY-030-500LA	PAF036H000E
Serial #	1303E26576	3094F06732 & 3094F06733	G064320753
Cooling Type	D/X, R-22	D/X, R-22	D/X, R-22
Cooling Capacity (Tons)	5	27	3
Cooling Efficiency (EER)	9.2	8.5 EER, 8.0 IPLV	9.0 (est)
Heating Type	N/A	Electric	N/A
Heating Input (MBH)	N/A	36 kW	N/A
Efficiency	N/A	N/A	N/A
Fuel	N/A	N/A	N/A
Approx Age	8	17	5
ASHRAE Service Life	15	15	15
Remaining Life	7	(2)	10
Comments	Unit is in good condition	Unit is in good condition	Unit is in good condition

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Rooftop / AC Units

Tag	RTU-6		
Unit Type	Packaged Rooftop Unit		
Qty	1		
Location	Roof		
Area Served	Classroom 121		
Manufacturer	Comfortmaker, Snyder General		
Model #	RD5320363		
Serial #	R902100004		
Cooling Type	D/X, R-22		
Cooling Capacity (Tons)	3		
Cooling Efficiency (EER)	8.0 (est)		
Heating Type	N/A		
Heating Input (MBH)	N/A		
Efficiency	N/A		
Fuel	N/A		
Approx Age	21		
ASHRAE Service Life	15		
Remaining Life	(6)		
Comments	Unit is in poor condition		

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Boilers

Tag	B-1, 2 & 3	B-4 & 5	
Unit Type	Cast Iron Water Tube Sectional Hot Water Boiler	Cast Iron Water Tube Sectional Steam Boiler	
Qty	3	2	
Location	Main Boiler Room	East Boiler Room	
Area Served	West Building Hot water loop	East building, HX-1 and HX-2	
Manufacturer	H.B. Smith	H.B. Smith	
Model #	Mills 440-1	Mills 440-1	
Serial #	-	-	
Input Capacity (MBH)	6,200	3,500	
Rated Output Capacity (Btu/Hr)	4,960	2,800	
Approx. Efficiency %	70% (est)	70% (est)	
Fuel	Natural Gas	Natural Gas	
Approx Age	52	49	
ASHRAE Service Life	30	30	
Remaining Life	(22)	(19)	
Comments	Boilers are original to the building and are in poor condition	Boilers are original to the building and are in poor condition	

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Pumps

Tag	HWP-1	HWP-2	HWP-3
Unit Type	Base mounted, end-suction	Base mounted, end-suction	Base mounted, end-suction
Qty	1	1	1
Location	Main Boiler Room	Main Boiler Room	Main Boiler Room
Area Served	Hot Water Heating loop	Hot Water Heating loop, Zone 1	Hot Water Heating loop, Zone 3
Manufacturer	Bell & Gossett	Bell & Gossett	Bell & Gossett
Model #	1850II	-	1850II
Serial #	-	-	1627748
Horse Power	7.5	1.5	7.5
Flow	-	-	-
Motor Info	A.O. Smith	A.O. Smith	Leland Faraday
Electrical Power	208-230/460	208-230/460	208-230/460
RPM	1760	1750	1750
Motor Efficiency %	86.5% (est)	82.0% (est)	86.5% (est)
Approx Age	Unknown	Unknown	Unknown
ASHRAE Service Life	20	20	20
Remaining Life	-	-	-
Comments	Age of pump and motor is unknown, pump is in fair to poor condition	Age of pump and motor is unknown, pump is in fair to poor condition	Age of pump and motor is unknown, pump is in fair to poor condition

MAJOR EQUIPMENT LIST

Concord Engineering Group
Brick Township BOE
Brick Township High School

Pumps

Tag	HWP-4	DWHP-1	HWP-5
Unit Type	Base mounted, end-suction	In-line	Base mounted, end-suction
Qty	1	1	1
Location	Main Boiler Room	Main Boiler Room	East Boiler Room
Area Served	Hot Water Heating loop	Domesit hot water booster pump	East section hot water loop (HX-1)
Manufacturer	Bell & Gossett	Bell & Gossett	Taco
Model #	1850II	186863 F60	2-6/6.1
Serial #	-		-
Horse Power	10	1/2	1
Flow	-	-	46 gpm @ 35 ft HD
Motor Info	Baldor	B&G	-
Electrical Power	208-230/460	208-230/460	230/460
RPM	1760	1725	-
Motor Efficiency %	87.5%	82.5% (est)	80.5% (est)
Approx Age	Unknown	Unknown	Unknown
ASHRAE Service Life	20	10	20
Remaining Life	-		
Comments	Age of pump and motor is unknown, pump is in fair to poor condition	Age of pump and motor is unknown, pump is in good condition	Age of pump and motor is unknown, pump is in poor condition

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Pumps

Tag	HWP-6	HWP-7	HWP-8
Unit Type	Base mounted, end-suction	Base mounted, end-suction	Base mounted, end-suction
Qty	1	1	1
Location	East Boiler Room	East Boiler Room	East Boiler Room
Area Served	East Wing hot water loop (HX-1)	East Wing hot water loop (HX-1)	East section hot water loop (HX-2)
Manufacturer	Taco	Taco	Bell & Gossett
Model #	2-6/6.1	3-8/7.4	185011
Serial #	-		-
Horse Power	1	3	3
Flow	46 gpm @ 35 ft HD	115 gpm @ 50 ft HD	-
Motor Info	-	Wagner	-
Electrical Power	230/460	230/460	230/460
RPM	1760	1750	1750
Motor Efficiency %	80.5% (est)	85.5% (est)	85.5% (est)
Approx Age	Unknown	Unknown	41
ASHRAE Service Life	20	20	20
Remaining Life	-	-	-21
Comments	Age of pump and motor is unknown, pump is in poor condition	Age of pump and motor is unknown, pump is in poor condition	Pump is in poor condition

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Heating and Ventilating Units

Tag	HV-1, 2	HV-3, 4	HV-5, 6
Unit Type	Heating and Ventilating Unit	Heating and Ventilating Unit	Heating and Ventilating Unit
Qty	2	2	2
Location	Ceiling	Ceiling	Roof
Area Served	Boys and Girls Auxiliary Gym	Boys and Girls East Gym	Boys and Girls West Gym
Manufacturer	Unknown	Unknown	Unknown
Model #	-	-	-
Serial #	-	-	-
Fan HP	-	-	-
Cooling Type	None	None	None
Heating Type	Hot Water Coil	Steam Coil	Hot Water Coil
Heating Input (MBH)	-	-	-
Efficiency	-	-	-
Approx Age	50	50	53
Ashrae Service Life	15	15	15
Remaining Life	-35	-35	-38
Comments	Unit is in fair to poor condition, pneumatically controlled 3-way valve	Unit has not been functional for 8+ years, per facility maintenance personnel	Unit is in fair to poor condition, pneumatically controlled 3-way valve

MAJOR EQUIPMENT LIST

Concord Engineering Group

Brick Township BOE

Brick Township High School

Unit Ventilators

Tag	UV		
Unit Type	Thru Wall Unit Ventilator		
Qty	83 (est)		
Location	Perimeter Classrooms		
Manufacturer	Nesbitt Syncretizer		
Model #	TW 1250 A-A		
Serial #	varies		
Cooling Capacity (Tons)	N/A		
Estimated Cooling Efficiency (EER)	N/A		
Heating Type	Hot Water Coil		
Heating Input (MBH)	-		
Approx Age	50		
Ashrae Service Life	15		
Remaining Life	(35.00)		
Comments	Units are in fair to poor condition		

APPENDIX E

Investment Grade Lighting Audit

CEG Job #: 9C11006
Project: Brick Township BOE LGEA
346 Chambers Bridge Road
Brick, NJ 08724
Bldg. Sq. Ft. 216,326

BrickTownship High School

KWH COST: $0.133

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
222.21	Corridor 123-126	3000	5	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	930.0	$123.69	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
111.11	Corridor Boys/Girls	3000	2	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.10	288.0	$38.30	2	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.05	150	$19.95	$80.00	$160.00	0.05	138	$18.35	8.72
222.21	Corridor Storage - JC	3000	20	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.24	3,720.0	$494.76	20	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Corridor Auditorium - Left	3000	16	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.99	2,976.0	$395.81	16	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Corridor Auditorium - Back	3000	12	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.74	2,232.0	$296.86	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Corridor Auditorium - Right	3000	13	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.81	2,418.0	$321.59	13	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	122	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	120	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972.0	$129.28	18	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	118	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972.0	$129.28	18	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Women's Rest Room	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
621	JC	500	1	1	Recessed Light, 100w A Lamp	100	0.10	50.0	$6.65	1	1	(1) 26w CFL Lamp	26	0.03	13	$1.73	$20.00	$20.00	0.07	37	$4.92	4.06
221.11	Men's Rest Room	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	114	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	112	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	110	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	108	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	106	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
222.21	Corridor S#2 - 120	3000	20	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.24	3,720.0	$494.76	20	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
111.11	Corridor Boys/Girls	3000	2	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.10	288.0	$38.30	2	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.05	150	$19.95	$80.00	$160.00	0.05	138	$18.35	8.72
111.11	104	1800	21	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	1.01	1,814.4	$241.32	21	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.53	945	$125.69	$80.00	$1,680.00	0.48	869.4	$115.63	14.53
222.21	Corridor 104 - 101	3000	6	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.37	1,116.0	$148.43	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
621	Women's Rest Room	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180.0	$23.94	1	1	(1) 26w CFL Lamp	26	0.03	46.8	$6.22	$20.00	$20.00	0.07	133.2	$17.72	1.13
1		1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
621	Boy's Rest Room	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180.0	$23.94	1	1	(1) 26w CFL Lamp	26	0.03	46.8	$6.22	$20.00	$20.00	0.07	133.2	$17.72	1.13
1		1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	105	1800	23	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.43	2,566.8	$341.38	23	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Storage	500	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	93.0	$12.37	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11		500	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	31.0	$4.12	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	102	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972.0	$129.28	18	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	103	1800	9	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.59	1,053.0	$140.05	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Athletic Office	1800	10	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.30	540.0	$71.82	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	A	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	B	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	C	1800	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.12	223.2	$29.69	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Special Services	1800	8	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.24	432.0	$57.46	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Special Services Storage	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	300	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	302	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	304	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	306	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	308	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Boy's Rest Room	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Girl's Rest Room	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	310	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	East Office Lobby	3000	7	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.43	1,302.0	$173.17	7	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Café #1	1800	20	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	1.24	2,232.0	$296.86	20	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Kitchen	1800	33	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	2.05	3,682.8	$489.81	33	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
621	Kitchen JC	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180.0	$23.94	1	1	(1) 26w CFL Lamp	26	0.03	46.8	$6.22	$20.00	$20.00	0.07	133.2	$17.72	1.13
1	Kitchen Women's	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Kitchen Office	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
121.11	Girl's Locker Room	3000	6	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	78	0.47	1,404.0	$186.73	6	2	2 Lamp, 32w T8, Elect. Ballast; retrofit	58	0.35	1044	$138.85	$100.00	$600.00	0.12	360	$47.88	12.53
111.11	Girl's Locker Toilet/Shower Room	3000	3	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.14	432.0	$57.46	3	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.08	225	$29.93	$80.00	$240.00	0.07	207	$27.53	8.72
221.11		3000	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	186.0	$24.74	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1	Girl's Locker Room	3000	1	1	22w Circuline Fluor.	25	0.03	75.0	$9.98	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
736	GYM	1800	20	1	175w MH, Pendant Mnt., Prismatic Lens	210	4.20	7,560.0	$1,005.48	20	6	2x4, 6 Lamp, 32w T8, Elect. Ballast, w/Wire Guard - Lo Bay	168	3.36	6048	$804.38	$220.00	$4,400.00	0.84	1512	$201.10	21.88

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
221.11	Café #2	1800	20	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	1.24	2,232.0	$296.86	20	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Corridor - Café #1 - Storage	300	18	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.12	334.8	$44.53	18	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	East Gym Lobby	1800	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
736	Gym Aux.	1800	18	1	175w MH, Pendant Mnt., Prismatic Lens	210	3.78	6,804.0	$904.93	18	6	2x4, 6 Lamp, 32w T8, Elect. Ballast, w/Wire Guard - Lo Bay	168	3.02	5443.2	$723.95	$220.00	$3,960.00	0.76	1360.8	$180.99	21.88
111.11	Team Room	1800	14	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.67	1,209.6	$160.88	14	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.35	630	$83.79	$80.00	$1,120.00	0.32	579.6	$77.09	14.53
221.11	Team Toilet Room	1800	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	223.2	$29.69	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Team Shower	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.21	Team Back Entry	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
111.11	Meeting Room	1800	6	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.29	518.4	$68.95	6	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.15	270	$35.91	$80.00	$480.00	0.14	248.4	$33.04	14.53
221.21	Meeting Room Toilet	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Meeting Room Vestibule	3000	1	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.03	90.0	$11.97	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
232.21		3000	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	516.0	$68.63	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
736	Weight Room	1800	15	1	175w MH, Pendant Mnt., Prismatic Lens	210	3.15	5,670.0	$754.11	15	6	2x4, 6 Lamp, 32w T8, Elect. Ballast, w/Wire Guard - Lo Bay	168	2.52	4536	$603.29	$220.00	$3,300.00	0.63	1134	$150.82	21.88
232.21	Vestibule	3000	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.34	1,032.0	$137.26	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Stair # 5	3000	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	372.0	$49.48	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1		3000	1	1	22w Circuline Fluor.	25	0.03	75.0	$9.98	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	401	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	403	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
621	Boy's Rest Room	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180.0	$23.94	1	1	(1) 26w CFL Lamp	26	0.03	46.8	$6.22	$20.00	$20.00	0.07	133.2	$17.72	1.13

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
621	Girl's Rest Room	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180.0	$23.94	1	1	(1) 26w CFL Lamp	26	0.03	46.8	$6.22	$20.00	$20.00	0.07	133.2	$17.72	1.13
1		1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	405	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	407	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	409	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	411	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972.0	$129.28	18	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	413	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	415	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972.0	$129.28	18	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Corridor - ST #3 - ST #5	3000	12	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.74	2,232.0	$296.86	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Corridor - ST #5 - ST #3	3000	11	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.68	2,046.0	$272.12	11	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	208	1800	9	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.96	1,733.4	$230.54	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	206	1800	33	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.99	1,782.0	$237.01	33	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	204	1800	9	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.96	1,733.4	$230.54	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	202	1800	12	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	2,311.2	$307.39	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	207	1800	9	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.96	1,733.4	$230.54	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	211	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	213	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	215	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
222.21	Corridor - Storage - 211	3000	7	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.43	1,302.0	$173.17	7	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	217	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	219	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	221	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	223	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Corridor - 223 - 217	3000	7	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.43	1,302.0	$173.17	7	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Corridor - Girls - Boys	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Corridor - Receiving	3000	7	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.43	1,302.0	$173.17	7	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Corridor - Girls - Boys	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
227.21	Café #3	1800	27	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	1.76	3,159.0	$420.15	27	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
560	Auditorium	1800	2	1	Recessed Down Light, 26w CFL Lamp	26	0.05	93.6	$12.45	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
560	Stage	1800	8	1	Recessed Down Light, 26w CFL Lamp	26	0.21	374.4	$49.80	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
560	Stage Storage	500	1	1	Recessed Down Light, 26w CFL Lamp	26	0.03	13.0	$1.73	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
621		500	1	1	Recessed Light, 100w A Lamp	100	0.10	50.0	$6.65	1	1	(1) 26w CFL Lamp	26	0.03	13	$1.73	$20.00	$20.00	0.07	37	$4.92	4.06
560	Auditorium	1800	6	1	Recessed Down Light, 26w CFL Lamp	26	0.16	280.8	$37.35	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612		1800	32	1	Pendant Mnt., 100w A19 Lamp	100	3.20	5,760.0	$766.08	32	1	(1) 26w CFL Lamp	26	0.83	1497.6	$199.18	$20.00	$640.00	2.37	4262.4	$566.90	1.13
736	West Gym	1800	20	1	175w MH, Pendant Mnt., Prismatic Lens	210	4.20	7,560.0	$1,005.48	20	6	2x4, 6 Lamp, 32w T8, Elect. Ballast, w/Wire Guard - Lo Bay	168	3.36	6048	$804.38	$220.00	$4,400.00	0.84	1512	$201.10	21.88

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
36	Girls Locker	3000	1	1	Pendant Down Light, 1 Lamp, 26w	26	0.03	78.0	$10.37	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Girls Locker Office	3000	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	180.0	$23.94	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612	Girl's Locker Toilet Room	3000	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	300.0	$39.90	1	1	(1) 26w CFL Lamp	26	0.03	78	$10.37	$20.00	$20.00	0.07	222	$29.53	0.68
649	Girl's Locker Room	3000	12	2	1x1 Surface Mount, Prismatic Lens, (2) 13w CFL Lamp	26	0.31	936.0	$124.49	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612	Girl's Locker Room Shower	3000	2	1	Pendant Mnt., 100w A19 Lamp	100	0.20	600.0	$79.80	2	1	(1) 26w CFL Lamp	26	0.05	156	$20.75	$20.00	$40.00	0.15	444	$59.05	0.68
612	Girl's Locker Room Storage	500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50.0	$6.65	1	1	(1) 26w CFL Lamp	26	0.03	13	$1.73	$20.00	$20.00	0.07	37	$4.92	4.06
36	Boy's Locker Room	3000	1	1	Pendant Down Light, 1 Lamp, 26w	26	0.03	78.0	$10.37	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612		3000	8	1	Pendant Mnt., 100w A19 Lamp	100	0.80	2,400.0	$319.20	8	1	(1) 26w CFL Lamp	26	0.21	624	$82.99	$20.00	$160.00	0.59	1776	$236.21	0.68
612	Boy's Locker Room Toilet	3000	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	300.0	$39.90	1	1	(1) 26w CFL Lamp	26	0.03	78	$10.37	$20.00	$20.00	0.07	222	$29.53	0.68
211.41	Boy's Locker Room Office	3000	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	180.0	$23.94	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Janitor's Office	3000	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.21	642.0	$85.39	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612	Boiler Room	3000	9	1	Pendant Mnt., 100w A19 Lamp	100	0.90	2,700.0	$359.10	9	1	(1) 26w CFL Lamp	26	0.23	702	$93.37	$20.00	$180.00	0.67	1998	$265.73	0.68
222.21	Café #3	1800	27	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.67	3,013.2	$400.76	27	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Kitchen	1800	7	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.21	378.0	$50.27	7	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.34		1800	4	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic	30	0.12	216.0	$28.73	4	1	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Faculty	1800	6	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.37	669.6	$89.06	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Office A	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Office B	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Office C	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.21	Office D	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Faculty Corridor	3000	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	744.0	$98.95	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.34	Storage	500	4	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic	30	0.12	60.0	$7.98	4	1	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612	JC	500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50.0	$6.65	1	1	(1) 26w CFL Lamp	26	0.03	13	$1.73	$20.00	$20.00	0.07	37	$4.92	4.06
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	224	1800	24	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	1.49	2,678.4	$356.23	24	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Storage	500	5	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.15	75.0	$9.98	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612		500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50.0	$6.65	1	1	(1) 26w CFL Lamp	26	0.03	13	$1.73	$20.00	$20.00	0.07	37	$4.92	4.06
211.34	226	1800	25	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic	30	0.75	1,350.0	$179.55	25	1	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	227	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	225	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	34	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	33	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	32	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	31	1800	20	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.60	1,080.0	$143.64	20	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	30	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	West Nurses Office	1800	8	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.24	432.0	$57.46	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1		1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612	JC	500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50.0	$6.65	1	1	(1) 26w CFL Lamp	26	0.03	13	$1.73	$20.00	$20.00	0.07	37	$4.92	4.06
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	124	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1,134.0	$150.82	21	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	126	1800	31	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.93	1,674.0	$222.64	31	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	127	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1,134.0	$150.82	21	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	125	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1,134.0	$150.82	21	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	123	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1,134.0	$150.82	21	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Detective	3000	6	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.18	540.0	$71.82	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11		3000	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	372.0	$49.48	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Main Office	1800	4	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.12	216.0	$28.73	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
111.11	Office A	1800	1	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.05	86.4	$11.49	1	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.03	45	$5.99	$80.00	$80.00	0.02	41.4	$5.51	14.53
111.11	Office B	1800	1	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.05	86.4	$11.49	1	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.03	45	$5.99	$80.00	$80.00	0.02	41.4	$5.51	14.53
111.11	Office C	1800	2	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.10	172.8	$22.98	2	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.05	90	$11.97	$80.00	$160.00	0.05	82.8	$11.01	14.53
111.11	Conference Room	1800	2	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.10	172.8	$22.98	2	1	Reballast & Relamp; Sylvania Lamp FO28/841/SS/ECO	25	0.05	90	$11.97	$80.00	$160.00	0.05	82.8	$11.01	14.53
211.41	Break Room	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.21	Corridor	3000	3	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Display Case	30	0.09	270.0	$35.91	3	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.25	Main Office	1800	13	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Primatic Lens	30	0.39	702.0	$93.37	13	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41		1800	5	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.15	270.0	$35.91	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	Guidance	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1,296.0	$172.37	24	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 1	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 2	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 3	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 4	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 5	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 6	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 7	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 8	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 9	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office 10	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Conference Room	1800	9	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.27	486.0	$64.64	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612	JC	500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50.0	$6.65	1	1	(1) 26w CFL Lamp	26	0.03	13	$1.73	$20.00	$20.00	0.07	37	$4.92	4.06
211.41	121	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	119	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	117	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
111.21	Stair #1	1800	4	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Recessed Mnt., Prismatic Lens	48	0.19	345.6	$45.96	4	1	1 Lamp, 32w T8, Elect. Ballast; retrofit	30	0.12	216	$28.73	$80.00	$320.00	0.07	129.6	$17.24	18.56

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	115	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648.0	$86.18	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	MCA	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Copier Room	1800	8	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.24	432.0	$57.46	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office LIB 1	1800	6	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.18	324.0	$43.09	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office LIB 2	1800	6	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.18	324.0	$43.09	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Office LIB 3	1800	6	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.18	324.0	$43.09	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Library	1800	46	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	4.92	8,859.6	$1,178.33	46	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Office 1	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90.0	$11.97	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Conference Room	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Conference Room	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	AV	1800	9	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.27	486.0	$64.64	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.25		1800	28	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Primatic Lens	30	0.84	1,512.0	$201.10	28	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Magazine Room	1800	9	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.27	486.0	$64.64	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	Storage	500	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	53.5	$7.12	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	101	1800	10	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	1,926.0	$256.16	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
111.21	Stair #2	3000	4	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Recessed Mnt., Prismatic Lens	48	0.19	576.0	$76.61	4	1	1 Lamp, 32w T8, Elect. Ballast; retrofit	30	0.12	360	$47.88	$80.00	$320.00	0.07	216	$28.73	11.14
211.41	301	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1,296.0	$172.37	24	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	303	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1,296.0	$172.37	24	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	305	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1,296.0	$172.37	24	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	307	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1,296.0	$172.37	24	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.21	East Office	1800	6	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.37	669.6	$89.06	6	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.21	Office 1	1800	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.12	223.2	$29.69	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.21	Conference Room	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.21	Corridor	3000	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.12	372.0	$49.48	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
3520	Closet	500	1	2	Ceiling Mount White Globe, (2) 26w CFL Lamp	52	0.05	26.0	$3.46	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
3520	Men's Rest Room	1800	1	2	Ceiling Mount White Globe, (2) 26w CFL Lamp	52	0.05	93.6	$12.45	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.21	Asst. Principal	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.12	Women's Rest Room	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.12	Server Room	500	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	31.0	$4.12	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	10	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	11	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1,134.0	$150.82	21	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Storage	500	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.25	124.0	$16.49	4	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	12	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1,134.0	$150.82	21	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Faculty	1800	22	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.66	1,188.0	$158.00	22	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612	Electrical #3	500	4	1	Pendant Mnt., 100w A19 Lamp	100	0.40	200.0	$26.60	4	1	(1) 26w CFL Lamp	26	0.10	52	$6.92	$20.00	$80.00	0.30	148	$19.68	4.06
242.21	402	1800	11	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.18	2,118.6	$281.77	11	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	400	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	406	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	408	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972.0	$129.28	18	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	410	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	412	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	414	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810.0	$107.73	15	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	Stair # 3	3000	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	372.0	$49.48	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1		3000	1	1	22w Circuline Fluor.	25	0.03	75.0	$9.98	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	201	1800	12	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	2,311.2	$307.39	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	203	1800	10	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	1,926.0	$256.16	10	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	205	1800	12	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	2,311.2	$307.39	12	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
242.21	209	1800	9	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.96	1,733.4	$230.54	9	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	210	1800	28	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.84	1,512.0	$201.10	28	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	210A	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
221.11	212	1800	28	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	1.74	3,124.8	$415.60	28	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	222	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	220	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	218	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	216	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00

Investment Grade Lighting Audit

ECM #1: Lighting Upgrade - General

EXISTING LIGHTING										PROPOSED LIGHTING									SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Lamps	Retro-Unit Description	Watts Used	Total kW	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	Office	1800	5	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.15	270.0	$35.91	5	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	Asst. Principal	1800	8	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.24	432.0	$57.46	8	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
222.21	Faculty	1800	1	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
1		1800	1	1	22w Circuline Fluor.	25	0.03	45.0	$5.99	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
200.21		1800	1	2	1x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	34	0.03	61.2	$8.14	1	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
612	Men's Rest Room	1800	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	180.0	$23.94	1	1	(1) 26w CFL Lamp	26	0.03	46.8	$6.22	$20.00	$20.00	0.07	133.2	$17.72	1.13
612	Women's Rest Room	1800	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	180.0	$23.94	1	1	(1) 26w CFL Lamp	26	0.03	46.8	$6.22	$20.00	$20.00	0.07	133.2	$17.72	1.13
211.41	20	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	21	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	22	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756.0	$100.55	14	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	23	1800	23	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.69	1,242.0	$165.19	23	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
211.41	23A	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108.0	$14.36	2	0	No Change	0	0.00	0	$0.00	$0.00	$0.00	0.00	0	$0.00	0.00
	Totals		2,310	378		13,425	116	221,233	$29,424	2,310	62			16.0	29,941	$3,982	$2,360	$23,040	9.8	18,917.0	$2,516	9.16

CEG Job #: 9C11006
Project: Brick Township BOE LGEA
Address: 346 Chambers Bridge Road
Brick, NJ 08724
Building SF: 216,326

KWH COST: $0.133

FALSE

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS											SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
222.21	Corridor 123-126	3000	5	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.31	930	$123.69	5		No Change	62	0.31	0%	930	$123.69		$0.00	0.00	0	$0.00	0.00
111.11	Corridor Boys/Girls	3000	2	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.10	288	$38.30	2		No Change	48	0.10	0%	288	$38.30		$0.00	0.00	0	$0.00	0.00
222.21	Corridor Storage - JC	3000	20	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.24	3720	$494.76	20		No Change	62	1.24	0%	3720	$494.76		$0.00	0.00	0	$0.00	0.00
222.21	Corridor Auditorium - Left	3000	16	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.99	2976	$395.81	16		No Change	62	0.99	0%	2976	$395.81		$0.00	0.00	0	$0.00	0.00
222.21	Corridor Auditorium - Back	3000	12	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.74	2232	$296.86	12		No Change	62	0.74	0%	2232	$296.86		$0.00	0.00	0	$0.00	0.00
222.21	Corridor Auditorium -Right	3000	13	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.81	2418	$321.59	13		No Change	62	0.81	0%	2418	$321.59		$0.00	0.00	0	$0.00	0.00
211.41	122	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	120	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972	$129.28	18	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.43	20%	777.6	$103.42	$225.00	$225.00	0.11	194.4	$25.86	8.70
211.41	118	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972	$129.28	18	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.43	20%	777.6	$103.42	$225.00	$225.00	0.11	194.4	$25.86	8.70
221.11	Women's Rest Room	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3		No Change	62	0.19	0%	334.8	$44.53		$0.00	0.00	0	$0.00	0.00
621	JC	500	1	1	Recessed Light, 100w A Lamp	100	0.10	50	$6.65	1		No Change	100	0.10	0%	50	$6.65		$0.00	0.00	0	$0.00	0.00
221.11	Men's Rest Room	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3		No Change	62	0.19	0%	334.8	$44.53		$0.00	0.00	0	$0.00	0.00
211.41	114	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
211.41	112	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
211.41	110	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	108	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
211.41	106	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
222.21	Corridor S#2 - 120	3000	20	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.24	3720	$494.76	20		No Change	62	1.24	0%	3720	$494.76		$0.00	0.00	0	$0.00	0.00
111.11	Corridor Boys/Girls	3000	2	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.10	288	$38.30	2		No Change	48	0.10	0%	288	$38.30		$0.00	0.00	0	$0.00	0.00
111.11	104	1800	21	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	1.01	1814.4	$241.32	21	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	48	0.81	20%	1451.52	$193.05	$225.00	$225.00	0.20	362.88	$48.26	4.66
222.21	Corridor 104 - 101	3000	6	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.37	1116	$148.43	6		No Change	62	0.37	0%	1116	$148.43		$0.00	0.00	0	$0.00	0.00
621	Women's Rest Room	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180	$23.94	1		No Change	100	0.10	0%	180	$23.94		$0.00	0.00	0	$0.00	0.00
1	0	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
621	Boy's Rest Room	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180	$23.94	1		No Change	100	0.10	0%	180	$23.94		$0.00	0.00	0	$0.00	0.00
1		1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
222.21	105	1800	23	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.43	2566.8	$341.38	23	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	62	1.14	20%	2053.44	$273.11	$225.00	$225.00	0.29	513.36	$68.28	3.30
222.21	Storage	500	3	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.19	93	$12.37	3		No Change	62	0.19	0%	93	$12.37		$0.00	0.00	0	$0.00	0.00
221.11		500	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	31	$4.12	1		No Change	62	0.06	0%	31	$4.12		$0.00	0.00	0	$0.00	0.00
211.41	102	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972	$129.28	18	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.43	20%	777.6	$103.42	$225.00	$225.00	0.11	194.4	$25.86	8.70
227.21	103	1800	9	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	0.59	1053	$140.05	9	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	65	0.47	20%	842.4	$112.04	$225.00	$225.00	0.12	210.6	$28.01	8.03
211.41	Athletic Office	1800	10	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.30	540	$71.82	10		No Change	30	0.30	0%	540	$71.82		$0.00	0.00	0	$0.00	0.00

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
242.21	A	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1		No Change	107	0.11	0%	192.6	$25.62		$0.00	0.00	0	$0.00	0.00
242.21	B	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1		No Change	107	0.11	0%	192.6	$25.62		$0.00	0.00	0	$0.00	0.00
222.21	C	1800	2	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.12	223.2	$29.69	2		No Change	62	0.12	0%	223.2	$29.69		$0.00	0.00	0	$0.00	0.00
211.41	Special Services	1800	8	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.24	432	$57.46	8	1	Dual Technology Occupancy Sensor - Switch Mnt.	30	0.19	20%	345.6	$45.96	$175.00	$175.00	0.05	86.4	$11.49	15.23
211.41	Special Services Storage	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	300	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
211.41	302	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
211.41	304	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
211.41	306	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
211.41	308	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
221.11	Boy's Rest Room	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3		No Change	62	0.19	0%	334.8	$44.53		$0.00	0.00	0	$0.00	0.00
221.11	Girl's Rest Room	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3		No Change	62	0.19	0%	334.8	$44.53		$0.00	0.00	0	$0.00	0.00
211.41	310	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
222.21	East Office Lobby	3000	7	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.43	1302	$173.17	7		No Change	62	0.43	0%	1302	$173.17		$0.00	0.00	0	$0.00	0.00
221.11	Café #1	1800	20	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	1.24	2232	$296.86	20		No Change	62	1.24	0%	2232	$296.86		$0.00	0.00	0	$0.00	0.00
221.11	Kitchen	1800	33	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	2.05	3682.8	$489.81	33		No Change	62	2.05	0%	3682.8	$489.81		$0.00	0.00	0	$0.00	0.00

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
621	Kitchen JC	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180	$23.94	1		No Change	100	0.10	0%	180	$23.94		$0.00	0.00	0	$0.00	0.00
1	Kitchen Women's	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
221.11	Kitchen Office	1800	3	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.19	334.8	$44.53	3	1	Dual Technology Occupancy Sensor - Switch Mnt.	62	0.15	20%	267.84	$35.62	$175.00	$175.00	0.04	66.96	$8.91	19.65
121.11	Girl's Locker Room	3000	6	2	1x4, 2-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	78	0.47	1404	$186.73	6		No Change	78	0.47	0%	1404	$186.73		$0.00	0.00	0	$0.00	0.00
111.11	Girl's Locker Toilet/Shower Room	3000	3	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.14	432	$57.46	3		No Change	48	0.14	0%	432	$57.46		$0.00	0.00	0	$0.00	0.00
221.11		3000	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	186	$24.74	1		No Change	62	0.06	0%	186	$24.74		$0.00	0.00	0	$0.00	0.00
1	Girl's Locker Room	3000	1	1	22w Circuline Fluor.	25	0.03	75	$9.98	1		No Change	25	0.03	0%	75	$9.98		$0.00	0.00	0	$0.00	0.00
736	GYM	1800	20	1	175w MH, Pendant Mnt., Prismatic Lens	210	4.20	7560	$1,005.48	20		No Change	210	4.20	0%	7560	$1,005.48		$0.00	0.00	0	$0.00	0.00
221.11	Café #2	1800	20	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	1.24	2232	$296.86	20		No Change	62	1.24	0%	2232	$296.86		$0.00	0.00	0	$0.00	0.00
222.21	Corridor - Café #1 - Storage	300	18	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.12	334.8	$44.53	18		No Change	62	1.12	0%	334.8	$44.53		$0.00	0.00	0	$0.00	0.00
222.21	East Gym Lobby	1800	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4		No Change	62	0.25	0%	446.4	$59.37		$0.00	0.00	0	$0.00	0.00
736	Gym Aux.	1800	18	1	175w MH, Pendant Mnt., Prismatic Lens	210	3.78	6804	$904.93	18		No Change	210	3.78	0%	6804	$904.93		$0.00	0.00	0	$0.00	0.00
111.11	Team Room	1800	14	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.67	1209.6	$160.88	14		No Change	48	0.67	0%	1209.6	$160.88		$0.00	0.00	0	$0.00	0.00
221.11	Team Toilet Room	1800	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	223.2	$29.69	2		No Change	62	0.12	0%	223.2	$29.69		$0.00	0.00	0	$0.00	0.00
221.11	Team Shower	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1		No Change	62	0.06	0%	111.6	$14.84		$0.00	0.00	0	$0.00	0.00
221.21	Team Back Entry	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1		No Change	62	0.06	0%	111.6	$14.84		$0.00	0.00	0	$0.00	0.00

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
111.11	Meeting Room	1800	6	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.29	518.4	$68.95	6		No Change	48	0.29	0%	518.4	$68.95		$0.00	0.00	0	$0.00	0.00
221.21	Meeting Room Toilet	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1		No Change	62	0.06	0%	111.6	$14.84		$0.00	0.00	0	$0.00	0.00
211.41	Meeting Room Vestibule	3000	1	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.03	90	$11.97	1		No Change	30	0.03	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
232.21		3000	2	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.17	516	$68.63	2		No Change	86	0.17	0%	516	$68.63		$0.00	0.00	0	$0.00	0.00
736	Weight Room	1800	15	1	175w MH, Pendant Mnt., Prismatic Lens	210	3.15	5670	$754.11	15		No Change	210	3.15	0%	5670	$754.11		$0.00	0.00	0	$0.00	0.00
232.21	Vestibule	3000	4	3	2x4, 3 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	86	0.34	1032	$137.26	4		No Change	86	0.34	0%	1032	$137.26		$0.00	0.00	0	$0.00	0.00
221.11	Stair # 5	3000	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	372	$49.48	2		No Change	62	0.12	0%	372	$49.48		$0.00	0.00	0	$0.00	0.00
1		3000	1	1	22w Circuline Fluor.	25	0.03	75	$9.98	1		No Change	25	0.03	0%	75	$9.98		$0.00	0.00	0	$0.00	0.00
211.41	401	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
211.41	403	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
621	Boy's Rest Room	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180	$23.94	1		No Change	100	0.10	0%	180	$23.94		$0.00	0.00	0	$0.00	0.00
1		1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
621	Girl's Rest Room	1800	1	1	Recessed Light, 100w A Lamp	100	0.10	180	$23.94	1		No Change	100	0.10	0%	180	$23.94		$0.00	0.00	0	$0.00	0.00
1		1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
211.41	405	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	407	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	409	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	411	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972	$129.28	18	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.43	20%	777.6	$103.42	$225.00	$225.00	0.11	194.4	$25.86	8.70
211.41	413	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	415	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972	$129.28	18	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.43	20%	777.6	$103.42	$225.00	$225.00	0.11	194.4	$25.86	8.70
222.21	Corridor - ST #3 - ST #5	3000	12	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.74	2232	$296.86	12		No Change	62	0.74	0%	2232	$296.86		$0.00	0.00	0	$0.00	0.00
222.21	Corridor - ST #5 - ST #3	3000	11	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.68	2046	$272.12	11		No Change	62	0.68	0%	2046	$272.12		$0.00	0.00	0	$0.00	0.00
242.21	208	1800	9	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.96	1733.4	$230.54	9	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	0.77	20%	1386.72	$184.43	$225.00	$225.00	0.19	346.68	$46.11	4.88
211.41	206	1800	33	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.99	1782	$237.01	33	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.79	20%	1425.6	$189.60	$225.00	$225.00	0.20	356.4	$47.40	4.75
242.21	204	1800	9	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.96	1733.4	$230.54	9	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	0.77	20%	1386.72	$184.43	$225.00	$225.00	0.19	346.68	$46.11	4.88
242.21	202	1800	12	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	2311.2	$307.39	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	1.03	20%	1848.96	$245.91	$225.00	$225.00	0.26	462.24	$61.48	3.66
242.21	207	1800	9	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.96	1733.4	$230.54	9	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	0.77	20%	1386.72	$184.43	$225.00	$225.00	0.19	346.68	$46.11	4.88
211.41	211	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	213	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	215	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
222.21	Corridor - Storage - 211	3000	7	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.43	1302	$173.17	7		No Change	62	0.43	0%	1302	$173.17		$0.00	0.00	0	$0.00	0.00
211.41	217	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	219	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	221	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	223	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
222.21	Corridor - 223 - 217	3000	7	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.43	1302	$173.17	7		No Change	62	0.43	0%	1302	$173.17		$0.00	0.00	0	$0.00	0.00
211.41	Corridor - Girls - Boys	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
222.21	Corridor - Receiving	3000	7	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.43	1302	$173.17	7		No Change	62	0.43	0%	1302	$173.17		$0.00	0.00	0	$0.00	0.00
211.41	Corridor - Girls - Boys	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
227.21	Café #3	1800	27	2	2x2, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	65	1.76	3159	$420.15	27		No Change	65	1.76	0%	3159	$420.15		$0.00	0.00	0	$0.00	0.00
560	Auditorium	1800	2	1	Recessed Down Light, 26w CFL Lamp	26	0.05	93.6	$12.45	2		No Change	26	0.05	0%	93.6	$12.45		$0.00	0.00	0	$0.00	0.00
560	Stage	1800	8	1	Recessed Down Light, 26w CFL Lamp	26	0.21	374.4	$49.80	8		No Change	26	0.21	0%	374.4	$49.80		$0.00	0.00	0	$0.00	0.00
560	Stage Storage	500	1	1	Recessed Down Light, 26w CFL Lamp	26	0.03	13	$1.73	1		No Change	26	0.03	0%	13	$1.73		$0.00	0.00	0	$0.00	0.00
621	0	500	1	1	Recessed Light, 100w A Lamp	100	0.10	50	$6.65	1		No Change	100	0.10	0%	50	$6.65		$0.00	0.00	0	$0.00	0.00
560	Auditorium	1800	6	1	Recessed Down Light, 26w CFL Lamp	26	0.16	280.8	$37.35	6		No Change	26	0.16	0%	280.8	$37.35		$0.00	0.00	0	$0.00	0.00
612		1800	32	1	Pendant Mnt., 100w A19 Lamp	100	3.20	5760	$766.08	32		No Change	100	3.20	0%	5760	$766.08		$0.00	0.00	0	$0.00	0.00

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
736	West Gym	1800	20	1	175w MH, Pendant Mnt., Prismatic Lens	210	4.20	7560	$1,005.48	20		No Change	210	4.20	0%	7560	$1,005.48		$0.00	0.00	0	$0.00	0.00
36	Girls Locker	3000	1	1	Pendant Down Light, 1 Lamp, 26w	26	0.03	78	$10.37	1		No Change	26	0.03	0%	78	$10.37		$0.00	0.00	0	$0.00	0.00
211.41	Girls Locker Office	3000	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	180	$23.94	2		No Change	30	0.06	0%	180	$23.94		$0.00	0.00	0	$0.00	0.00
612	Girl's Locker Toilet Room	3000	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	300	$39.90	1		No Change	100	0.10	0%	300	$39.90		$0.00	0.00	0	$0.00	0.00
649	Girl's Locker Room	3000	12	2	1x1 Surface Mount, Prismatic Lens, (2) 13w CFL Lamp	26	0.31	936	$124.49	12		No Change	26	0.31	0%	936	$124.49		$0.00	0.00	0	$0.00	0.00
612	Girl's Locker Room Shower	3000	2	1	Pendant Mnt., 100w A19 Lamp	100	0.20	600	$79.80	2		No Change	100	0.20	0%	600	$79.80		$0.00	0.00	0	$0.00	0.00
612	Girl's Locker Room Storage	500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50	$6.65	1		No Change	100	0.10	0%	50	$6.65		$0.00	0.00	0	$0.00	0.00
36	Boy's Locker Room	3000	1	1	Pendant Down Light, 1 Lamp, 26w	26	0.03	78	$10.37	1		No Change	26	0.03	0%	78	$10.37		$0.00	0.00	0	$0.00	0.00
612		3000	8	1	Pendant Mnt., 100w A19 Lamp	100	0.80	2400	$319.20	8		No Change	100	0.80	0%	2400	$319.20		$0.00	0.00	0	$0.00	0.00
612	Boy's Locker Room Toilet	3000	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	300	$39.90	1		No Change	100	0.10	0%	300	$39.90		$0.00	0.00	0	$0.00	0.00
211.41	Boy's Locker Room Office	3000	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	180	$23.94	2		No Change	30	0.06	0%	180	$23.94		$0.00	0.00	0	$0.00	0.00
242.21	Janitor's Office	3000	2	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.21	642	$85.39	2		No Change	107	0.21	0%	642	$85.39		$0.00	0.00	0	$0.00	0.00
612	Boiler Room	3000	9	1	Pendant Mnt., 100w A19 Lamp	100	0.90	2700	$359.10	9		No Change	100	0.90	0%	2700	$359.10		$0.00	0.00	0	$0.00	0.00
222.21	Café #3	1800	27	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	1.67	3013.2	$400.76	27		No Change	62	1.67	0%	3013.2	$400.76		$0.00	0.00	0	$0.00	0.00
211.41	Kitchen	1800	7	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.21	378	$50.27	7		No Change	30	0.21	0%	378	$50.27		$0.00	0.00	0	$0.00	0.00
211.34		1800	4	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic	30	0.12	216	$28.73	4		No Change	30	0.12	0%	216	$28.73		$0.00	0.00	0	$0.00	0.00

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
222.21	Faculty	1800	6	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.37	669.6	$89.06	6		No Change	62	0.37	0%	669.6	$89.06		$0.00	0.00	0	$0.00	0.00
242.21	Office A	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1		No Change	107	0.11	0%	192.6	$25.62		$0.00	0.00	0	$0.00	0.00
242.21	Office B	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1		No Change	107	0.11	0%	192.6	$25.62		$0.00	0.00	0	$0.00	0.00
242.21	Office C	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1		No Change	107	0.11	0%	192.6	$25.62		$0.00	0.00	0	$0.00	0.00
242.21	Office D	1800	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	192.6	$25.62	1		No Change	107	0.11	0%	192.6	$25.62		$0.00	0.00	0	$0.00	0.00
222.21	Faculty Corridor	3000	4	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	744	$98.95	4		No Change	62	0.25	0%	744	$98.95		$0.00	0.00	0	$0.00	0.00
211.34	Storage	500	4	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic	30	0.12	60	$7.98	4		No Change	30	0.12	0%	60	$7.98		$0.00	0.00	0	$0.00	0.00
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
612	JC	500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50	$6.65	1		No Change	100	0.10	0%	50	$6.65		$0.00	0.00	0	$0.00	0.00
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
221.11	224	1800	24	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	1.49	2678.4	$356.23	24	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	62	1.19	20%	2142.72	$284.98	$225.00	$225.00	0.30	535.68	$71.25	3.16
211.41	Storage	500	5	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.15	75	$9.98	5		No Change	30	0.15	0%	75	$9.98		$0.00	0.00	0	$0.00	0.00
612		500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50	$6.65	1		No Change	100	0.10	0%	50	$6.65		$0.00	0.00	0	$0.00	0.00
211.34	226	1800	25	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Pendant Mnt., Prismatic	30	0.75	1350	$179.55	25	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.60	20%	1080	$143.64	$225.00	$225.00	0.15	270	$35.91	6.27
211.41	227	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	225	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	34	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	33	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	32	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	31	1800	20	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.60	1080	$143.64	20	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.48	20%	864	$114.91	$225.00	$225.00	0.12	216	$28.73	7.83
211.41	30	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	West Nurses Office	1800	8	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.24	432	$57.46	8		No Change	30	0.24	0%	432	$57.46		$0.00	0.00	0	$0.00	0.00
1		1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
612	JC	500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50	$6.65	1		No Change	100	0.10	0%	50	$6.65		$0.00	0.00	0	$0.00	0.00
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
211.41	124	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1134	$150.82	21	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.50	20%	907.2	$120.66	$225.00	$225.00	0.13	226.8	$30.16	7.46
211.41	126	1800	31	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.93	1674	$222.64	31	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.74	20%	1339.2	$178.11	$225.00	$225.00	0.19	334.8	$44.53	5.05
211.41	127	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1134	$150.82	21	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.50	20%	907.2	$120.66	$225.00	$225.00	0.13	226.8	$30.16	7.46
211.41	125	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1134	$150.82	21	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.50	20%	907.2	$120.66	$225.00	$225.00	0.13	226.8	$30.16	7.46
211.41	123	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1134	$150.82	21	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.50	20%	907.2	$120.66	$225.00	$225.00	0.13	226.8	$30.16	7.46
211.41	Detective	3000	6	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.18	540	$71.82	6		No Change	30	0.18	0%	540	$71.82		$0.00	0.00	0	$0.00	0.00

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
221.11	Detective	3000	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	372	$49.48	2		No Change	62	0.12	0%	372	$49.48		$0.00	0.00	0	$0.00	0.00
211.41	Main Office	1800	4	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.12	216	$28.73	4		No Change	30	0.12	0%	216	$28.73		$0.00	0.00	0	$0.00	0.00
111.11	Office A	1800	1	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.05	86.4	$11.49	1		No Change	48	0.05	0%	86.4	$11.49		$0.00	0.00	0	$0.00	0.00
111.11	Office B	1800	1	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.05	86.4	$11.49	1		No Change	48	0.05	0%	86.4	$11.49		$0.00	0.00	0	$0.00	0.00
111.11	Office C	1800	2	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.10	172.8	$22.98	2		No Change	48	0.10	0%	172.8	$22.98		$0.00	0.00	0	$0.00	0.00
111.11	Conference Room	1800	2	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Surface Mnt., Prismatic Lens	48	0.10	172.8	$22.98	2		No Change	48	0.10	0%	172.8	$22.98		$0.00	0.00	0	$0.00	0.00
211.41	Break Room	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.21	Corridor	3000	3	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Display Case	30	0.09	270	$35.91	3		No Change	30	0.09	0%	270	$35.91		$0.00	0.00	0	$0.00	0.00
211.25	Main Office	1800	13	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Primatic Lens	30	0.39	702	$93.37	13		No Change	30	0.39	0%	702	$93.37		$0.00	0.00	0	$0.00	0.00
211.41		1800	5	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.15	270	$35.91	5		No Change	30	0.15	0%	270	$35.91		$0.00	0.00	0	$0.00	0.00
211.41	Guidance	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1296	$172.37	24		No Change	30	0.72	0%	1296	$172.37		$0.00	0.00	0	$0.00	0.00
211.41	Office 1	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	Office 2	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	Office 3	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	Office 4	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	Office 5	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	Office 6	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	Office 7	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	Office 8	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	Office 9	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	Office 10	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
211.41	Conference Room	1800	9	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.27	486	$64.64	9		No Change	30	0.27	0%	486	$64.64		$0.00	0.00	0	$0.00	0.00
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
612	JC	500	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	50	$6.65	1		No Change	100	0.10	0%	50	$6.65		$0.00	0.00	0	$0.00	0.00
211.41	121	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	119	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	117	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
111.21	Stair #1	1800	4	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Recessed Mnt., Prismatic Lens	48	0.19	345.6	$45.96	4		No Change	48	0.19	0%	345.6	$45.96		$0.00	0.00	0	$0.00	0.00
211.41	115	1800	12	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.36	648	$86.18	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.29	20%	518.4	$68.95	$225.00	$225.00	0.07	129.6	$17.24	13.05
221.11	MCA	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1		No Change	62	0.06	0%	111.6	$14.84		$0.00	0.00	0	$0.00	0.00
211.41	Copier Room	1800	8	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.24	432	$57.46	8		No Change	30	0.24	0%	432	$57.46		$0.00	0.00	0	$0.00	0.00

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	Office LIB 1	1800	6	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.18	324	$43.09	6		No Change	30	0.18	0%	324	$43.09		$0.00	0.00	0	$0.00	0.00
211.41	Office LIB 2	1800	6	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.18	324	$43.09	6		No Change	30	0.18	0%	324	$43.09		$0.00	0.00	0	$0.00	0.00
211.41	Office LIB 3	1800	6	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.18	324	$43.09	6		No Change	30	0.18	0%	324	$43.09		$0.00	0.00	0	$0.00	0.00
242.21	Library	1800	46	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	4.92	8859.6	$1,178.33	46		No Change	107	4.92	0%	8859.6	$1,178.33		$0.00	0.00	0	$0.00	0.00
221.11	Office 1	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4		No Change	62	0.25	0%	446.4	$59.37		$0.00	0.00	0	$0.00	0.00
1	Boy's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
1	Girl's Rest Room	1800	2	1	22w Circuline Fluor.	25	0.05	90	$11.97	2		No Change	25	0.05	0%	90	$11.97		$0.00	0.00	0	$0.00	0.00
221.11	Conference Room	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4		No Change	62	0.25	0%	446.4	$59.37		$0.00	0.00	0	$0.00	0.00
221.11	Conference Room	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4		No Change	62	0.25	0%	446.4	$59.37		$0.00	0.00	0	$0.00	0.00
211.41	AV	1800	9	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.27	486	$64.64	9		No Change	30	0.27	0%	486	$64.64		$0.00	0.00	0	$0.00	0.00
211.25		1800	28	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Primatic Lens	30	0.84	1512	$201.10	28		No Change	30	0.84	0%	1512	$201.10		$0.00	0.00	0	$0.00	0.00
211.41	Magazine Room	1800	9	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.27	486	$64.64	9	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.22	20%	388.8	$51.71	$225.00	$225.00	0.05	97.2	$12.93	17.40
242.21	Storage	500	1	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.11	53.5	$7.12	1		No Change	107	0.11	0%	53.5	$7.12		$0.00	0.00	0	$0.00	0.00
242.21	101	1800	10	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	1926	$256.16	10	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	0.86	20%	1540.8	$204.93	$225.00	$225.00	0.21	385.2	$51.23	4.39
111.21	Stair #2	3000	4	1	1x4, 1-Lamp, 34w T12, Mag. Ballast, Recessed Mnt., Prismatic Lens	48	0.19	576	$76.61	4		No Change	48	0.19	0%	576	$76.61		$0.00	0.00	0	$0.00	0.00
211.41	301	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1296	$172.37	24	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.58	20%	1036.8	$137.89	$225.00	$225.00	0.14	259.2	$34.47	6.53

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	303	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1296	$172.37	24	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.58	20%	1036.8	$137.89	$225.00	$225.00	0.14	259.2	$34.47	6.53
211.41	305	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1296	$172.37	24	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.58	20%	1036.8	$137.89	$225.00	$225.00	0.14	259.2	$34.47	6.53
211.41	307	1800	24	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.72	1296	$172.37	24	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.58	20%	1036.8	$137.89	$225.00	$225.00	0.14	259.2	$34.47	6.53
221.21	East Office	1800	6	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.37	669.6	$89.06	6		No Change	62	0.37	0%	669.6	$89.06		$0.00	0.00	0	$0.00	0.00
221.21	Office 1	1800	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.12	223.2	$29.69	2		No Change	62	0.12	0%	223.2	$29.69		$0.00	0.00	0	$0.00	0.00
221.21	Conference Room	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4		No Change	62	0.25	0%	446.4	$59.37		$0.00	0.00	0	$0.00	0.00
221.21	Corridor	3000	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.12	372	$49.48	2		No Change	62	0.12	0%	372	$49.48		$0.00	0.00	0	$0.00	0.00
3520	Closet	500	1	2	Ceiling Mount White Globe, (2) 26w CFL Lamp	52	0.05	26	$3.46	1		No Change	52	0.05	0%	26	$3.46		$0.00	0.00	0	$0.00	0.00
3520	Men's Rest Room	1800	1	2	Ceiling Mount White Globe, (2) 26w CFL Lamp	52	0.05	93.6	$12.45	1		No Change	52	0.05	0%	93.6	$12.45		$0.00	0.00	0	$0.00	0.00
221.21	Asst. Principal	1800	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.25	446.4	$59.37	4		No Change	62	0.25	0%	446.4	$59.37		$0.00	0.00	0	$0.00	0.00
221.12	Women's Rest Room	1800	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1		No Change	62	0.06	0%	111.6	$14.84		$0.00	0.00	0	$0.00	0.00
221.12	Server Room	500	1	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.06	31	$4.12	1		No Change	62	0.06	0%	31	$4.12		$0.00	0.00	0	$0.00	0.00
211.41	10	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	11	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1134	$150.82	21	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.50	20%	907.2	$120.66	$225.00	$225.00	0.13	226.8	$30.16	7.46
221.11	Storage	500	4	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.25	124	$16.49	4		No Change	62	0.25	0%	124	$16.49		$0.00	0.00	0	$0.00	0.00
211.41	12	1800	21	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.63	1134	$150.82	21	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.50	20%	907.2	$120.66	$225.00	$225.00	0.13	226.8	$30.16	7.46

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	Faculty	1800	22	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.66	1188	$158.00	22		No Change	30	0.66	0%	1188	$158.00		$0.00	0.00	0	$0.00	0.00
612	Electrical #3	500	4	1	Pendant Mnt., 100w A19 Lamp	100	0.40	200	$26.60	4		No Change	100	0.40	0%	200	$26.60		$0.00	0.00	0	$0.00	0.00
242.21	402	1800	11	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.18	2118.6	$281.77	11	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	0.94	20%	1694.88	$225.42	$225.00	$225.00	0.24	423.72	$56.35	3.99
211.41	400	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	406	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	408	1800	18	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.54	972	$129.28	18	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.43	20%	777.6	$103.42	$225.00	$225.00	0.11	194.4	$25.86	8.70
211.41	410	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	412	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
211.41	414	1800	15	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.45	810	$107.73	15	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.36	20%	648	$86.18	$225.00	$225.00	0.09	162	$21.55	10.44
221.11	Stair # 3	3000	2	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	0.12	372	$49.48	2		No Change	62	0.12	0%	372	$49.48		$0.00	0.00	0	$0.00	0.00
1		3000	1	1	22w Circuline Fluor.	25	0.03	75	$9.98	1		No Change	25	0.03	0%	75	$9.98		$0.00	0.00	0	$0.00	0.00
242.21	201	1800	12	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	2311.2	$307.39	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	1.03	20%	1848.96	$245.91	$225.00	$225.00	0.26	462.24	$61.48	3.66
242.21	203	1800	10	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.07	1926	$256.16	10	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	0.86	20%	1540.8	$204.93	$225.00	$225.00	0.21	385.2	$51.23	4.39
242.21	205	1800	12	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	1.28	2311.2	$307.39	12	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	1.03	20%	1848.96	$245.91	$225.00	$225.00	0.26	462.24	$61.48	3.66
242.21	209	1800	9	4	2x4, 4 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	107	0.96	1733.4	$230.54	9	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	107	0.77	20%	1386.72	$184.43	$225.00	$225.00	0.19	346.68	$46.11	4.88
211.41	210	1800	28	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.84	1512	$201.10	28	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.67	20%	1209.6	$160.88	$225.00	$225.00	0.17	302.4	$40.22	5.59

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	210A	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
221.11	212	1800	28	2	1x4, 2 Lamp, 32w T8, Elect. Ballast, Surface Mnt., Prismatic Lens	62	1.74	3124.8	$415.60	28	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	62	1.39	20%	2499.84	$332.48	$225.00	$225.00	0.35	624.96	$83.12	2.71
211.41	222	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	220	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	218	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	216	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	Office	1800	5	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.15	270	$35.91	5		No Change	30	0.15	0%	270	$35.91		$0.00	0.00	0	$0.00	0.00
211.41	Asst. Principal	1800	8	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.24	432	$57.46	8		No Change	30	0.24	0%	432	$57.46		$0.00	0.00	0	$0.00	0.00
222.21	Faculty	1800	1	2	2x4, 2 Lamp, 32w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	62	0.06	111.6	$14.84	1		No Change	62	0.06	0%	111.6	$14.84		$0.00	0.00	0	$0.00	0.00
1		1800	1	1	22w Circuline Fluor.	25	0.03	45	$5.99	1		No Change	25	0.03	0%	45	$5.99		$0.00	0.00	0	$0.00	0.00
200.21		1800	1	2	1x2, 2 Lamp, 17w T8, Elect. Ballast, Recessed Mnt., Prismatic Lens	34	0.03	61.2	$8.14	1		No Change	34	0.03	0%	61.2	$8.14		$0.00	0.00	0	$0.00	0.00
612	Men's Rest Room	1800	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	180	$23.94	1		No Change	100	0.10	0%	180	$23.94		$0.00	0.00	0	$0.00	0.00
612	Women's Rest Room	1800	1	1	Pendant Mnt., 100w A19 Lamp	100	0.10	180	$23.94	1		No Change	100	0.10	0%	180	$23.94		$0.00	0.00	0	$0.00	0.00
211.41	20	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	21	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19
211.41	22	1800	14	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.42	756	$100.55	14	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.34	20%	604.8	$80.44	$225.00	$225.00	0.08	151.2	$20.11	11.19

ECM #2: Lighting Controls

EXISTING LIGHTING										PROPOSED LIGHTING CONTROLS										SAVINGS			
CEG Type	Fixture Location	Yearly Usage	No. Fixts	No. Lamps	Fixture Type	Fixt Watts	Total kW	kWh/Yr Fixtures	Yearly $ Cost	No. Fixts	No. Cont.	Controls Description	Watts Used	Total kW	Reduction (%)	kWh/Yr Fixtures	Yearly $ Cost	Unit Cost (INSTALLED)	Total Cost	kW Savings	kWh/Yr Savings	Yearly $ Savings	Yearly Simple Payback
211.41	23	1800	23	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.69	1242	$165.19	23	1	Dual Tech. Occupancy Sensor w/ (1) 2 Pole Powerpack - Remote Mnt.	30	0.55	20%	993.6	$132.15	$225.00	$225.00	0.14	248.4	$33.04	6.81
211.41	23A	1800	2	1	1x4, 1 Lamp, 32w T8, Elect. Ballast, Surface Mnt.,	30	0.06	108	$14.36	2		No Change	30	0.06	0%	108	$14.36		$0.00	0.00	0	$0.00	0.00
	Totals		2,310	378			115.8	221,233.1	$29,424	2,310	88			105.3		202,315.1	$26,907.91		$19,700	10.51	18,918.0	$2,516	7.83

APPENDIX F

Location Description	Area (Sq FT)	Panel	Qty	Panel Sq Ft	Panel Total Sq Ft	Total KW_{DC}	Total Annual kWh	Total KW_{AC}	Panel Weight (41.9 lbs)	W/SQFT
Brick Township High School	37479	SHARP NU-U235F2	1531	17.5	26,855	359.79	438,574	290.8	64,149	13.40

.= Proposed PV Layout

Notes:

1. Estimated kWH based on the National Renewable Energy Laboratory PVWatts Version 1 Calculator Program.

PVWatts Program Data Output - Flat Roof Panels

Station Identification	
City:	Atlantic_City
State:	New_Jersey
Latitude:	39.45° N
Longitude:	74.57° W
Elevation:	20 m
PV System Specifications	
DC Rating:	359.0 kW
DC to AC Derate Factor:	0.810
AC Rating:	290.8 kW
Array Type:	Fixed Tilt
Array Tilt:	10.0°
Array Azimuth:	180.0°
Energy Specifications	
Cost of Electricity:	13.3 ¢/kWh

Results			
Month	Solar Radiation ($kWh/m^2/day$)	AC Energy (kWh)	Energy Value ($)
1	2.58	23320	3101.56
2	3.33	27537	3662.42
3	4.31	38457	5114.78
4	5.20	43806	5826.20
5	5.85	50031	6654.12
6	6.14	48697	6476.70
7	6.06	49193	6542.67
8	5.54	45208	6012.66
9	4.85	38871	5169.84
10	3.76	31740	4221.42
11	2.65	22239	2957.79
12	2.23	19475	2590.18
Year	4.38	438574	58330.34

Project Name: **LGEA Solar PV Project - 9C11006**
Location: **Brick Township High School**
Description: **Photovoltaic System 100% Financing - 15 year**

Simple Payback Analysis

	Photovoltaic System 100% Financing - 15 year
Total Construction Cost	$2,122,797
Annual kWh Production	438,574
Annual Energy Cost Reduction	$58,330
Average Annual SREC Revenue	$169,116

Simple Payback: **9.33** Years

Life Cycle Cost Analysis

Analysis Period (years): 15
Discount Rate: 3%
Average Energy Cost ($/kWh) **$0.133**
Financing Rate: 6.00%

Financing %: 100%
Maintenance Escalation Rate: 3.0%
Energy Cost Escalation Rate: 3.0%
Average SREC Value ($/kWh) $0.386

Period	Additional Cash Outlay	Energy kWh Production	Energy Cost Savings	Additional Maint Costs	SREC Revenue	Interest Expense	Loan Principal	Net Cash Flow	Cumulative Cash Flow
0	$0	0	0	0	$0	0	0	0	0
1	$0	438,574	$58,330	$0	$241,216	$124,918	$90,042	$84,586	$84,586
2	$0	436,381	$60,080	$0	$240,010	$119,365	$95,596	$85,129	$169,715
3	$0	434,199	$61,883	$0	$217,100	$113,469	$101,492	$64,022	$233,737
4	$0	432,028	$63,739	$0	$194,413	$107,209	$107,752	$43,191	$276,928
5	$0	429,868	$65,651	$4,428	$193,441	$100,563	$114,397	$39,704	$316,632
6	$0	427,719	$67,621	$4,406	$192,473	$93,507	$121,453	$40,728	$357,361
7	$0	425,580	$69,649	$4,383	$170,232	$86,016	$128,944	$20,538	$377,898
8	$0	423,452	$71,739	$4,362	$169,381	$78,063	$136,897	$21,798	$399,696
9	$0	421,335	$73,891	$4,340	$147,467	$69,620	$145,341	$2,058	$401,754
10	$0	419,228	$76,108	$4,318	$146,730	$60,656	$154,305	$3,559	$405,314
11	$0	417,132	$78,391	$4,296	$125,140	$51,138	$163,822	($15,726)	$389,587
12	$0	415,047	$80,743	$4,275	$124,514	$41,034	$173,926	($13,979)	$375,609
13	$0	412,971	$83,165	$4,254	$103,243	$30,307	$184,654	($32,806)	$342,803
14	$0	410,906	$85,660	$4,232	$102,727	$18,918	$196,043	($30,806)	$311,997
15	$0	408,852	$88,230	$4,211	$81,770	$6,826	$208,134	($49,171)	$262,825
	Totals:	6,353,273	$1,084,881	$47,505	$2,449,855	$1,101,609	$2,122,797	$262,825	$4,706,441

Net Present Value (NPV) **$254,880**

APPENDIX G

MONTHLY ENERGY CONSUMPTION

By CONCORD ENGINEERING GROUP

------- Monthly Energy Consumption -------

Utility	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Alternative: 2	**Brick Township HS Geothermal**												
Electric													
On-Pk Cons. (kWh)	196,101	200,248	192,974	126,593	137,086	96,752	113,985	125,932	137,442	137,707	159,811	190,338	1,814,972
On-Pk Demand (kW)	1,337	1,337	1,354	1,343	1,250	1,123	1,170	1,182	1,230	1,339	1,351	1,357	1,357
Gas													
On-Pk Cons. (therms)	1,315	1,653	637	140	78	26	24	28	71	157	344	1,026	5,500
On-Pk Demand (therms/hr)	18	19	17	14	1	0	0	0	1	12	16	18	19

Energy Consumption

Building	31,165	Btu/(ft2-year)
Source	88,555	Btu/(ft2-year)
Floor Area	216,410	ft2

Environmental Impact Analysis

CO2	1,408,563 lbm/year
SO2	3,828 gm/year
NOX	1,974 gm/year